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A

WEEK'S CONVERSATION

ON THE

PLURALITY OF WORLDS.

FROM THE FRENCH OF

MONSIEUR DE FONTENELLE,

AUTHOR OF

Dialogues of the Dead, &c.

TO WHICH IS PREFIXED,

A Memoir of the Author's Life and Writings,

BY M. DE VOLTAIRE.

THE EIGHTH EDITION,

WITH CONSIDERABLE IMPROVEMENTS.

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MEMOIR

OF

THE LIFE AND WRITINGS

OF THE LATE

MONSIEUR DE FONTENELLE.

BY M. DE VOLTAIRE.

Bernard Bouvier de Fontenelle, born at Rouen in 1658, may be considered as the most universal genius that the age of Louis XIV. has produced. He may be compared to those lands which are so happily situated as to be able to produce all kinds of fruit. He was scarcely twenty years old, when he wrote the greatest part of the tragic opera of *Bellerophon*, and afterwards composed the opera of *Thetis and Peleus*, in which he emulated Quinault, and which met with great success. That of *AEneas and Lavinia* was not so well received. He once tried his powers in tragedy, and assisted Mademoiselle Bernard in some of her pieces. He

universal applause. His *History of the Academy* often threw a striking light upon the most obscure memoirs. He was the first who introduced elegance into the sciences; and if sometimes he happened to ornament them too much, it was because his stile resembled those luxuriant harvests, where flowers spring naturally amidst the corn. His *History of the Academy of Sciences* would have proved as useful as it is well written, if it had been employed in giving an account of the truths discovered; but it explains the opinions that were combated against each other, the greatest part of which has been long since refuted. The eulogiums he spoke upon the academicians who died, possess the singular merit of rendering the sciences themselves more respectable, and their author also. In vain did the Abbe Des Fontaines, and others of the same class, attempt to obscure his fame. It is the common fate of great men to have despicable enemies. If he published, late in life, some indifferent comedies, and a defence of the vortices of Des Cartes, one

may pardon the first on account of his old age, and excuse the latter from the consideration of the prejudices of his youth, when such opinions had taken possession of his mind, in common with all the philosophers of Europe. In fine, he was regarded as the first of men, for the uncommon art of diffusing a lustre and grace over the abstract sciences; and he had great merit also, in all the other kinds of literature he engaged in. All these talents were sustained by a perfect knowledge in languages and history, and he was certainly superior to all the geniuses of his time who possessed not the merit of invention. His *History of the Oracles*, which is only an abridgement executed with discretion and moderation, of the great history of Vandalia, drew upon him enemies more violent than Racine or Boileau. Some Jesuits, who had compiled the lives of the saints, and who had the true spirit of compilers, wrote in their manner against the rational opinions of Vandalia and Fontenelle. The philosopher of Paris made no reply: but his friend.

the learned Basnage, a philosopher of Holland, answered them, and the compilers nonsense was no longer read. Many years after this, the Jesuit Tellier, confessor of Louis XIV. that unhappy author of all those disputes which produced so much evil and so much ridicule in France, impeached Fontenelle to Louis XIV. as an Athiest, and produced the allegory of *Mero and Enegu*, before mentioned. Marc-Rene de Paulmi, Marquis of Argenson, then lieutenant of the police, and since keeper of the seals, quashed the prosecution that was stirred up against him; a favour which the philosopher has fully acknowledged, in the eulogium he pronounced upon him in the Academy of Sciences. This anecdote is more curious than all that has been said by the Abbe Trublet about Fontenelle. He died on the 29th of January 1757, at the age of near a hundred.

A

CONVERSATION

ON THE

PLURALITY OF WORLDS.

To Monsieur L.

TO give you, Sir, a particular detail how I paſſed my time in the country with the Marchioneſs of G****, would make a large volume; and what is yet worſe, a volume of philoſophy: whereas the entertainments you expect are of another kind, as balls, gaming, hunting, &c. inſtead of which, you muſt put up with vortexes, planets, and new worlds; theſe were the ſubject of our converſation. Now, as you have the happineſs to be a philoſopher, one entertainment is the ſame to you as another. And I fancy, you will be pleaſed, that I have brought over the Marchioneſs to our party: we could not have gained a more conſiderable perſon; for youth and beauty are ever ineſtimable: if wiſdom would appear with ſucceſs to mankind, think you ſhe could do it more effectually than in

the perſon of this lady? And yet was her company but half ſo agreeable, I am perſuaded all the world would run mad after wiſdom. But, though I tell you all the diſcourſe I had with the lady, you muſt not expect miracles from me. It is impoſſible, without her wit, to expreſs her ſentiments, in the ſame manner ſhe delivered them. For my part, I think her very learned from the great diſpoſition ſhe has to learning. It is not poring upon books that makes a man a ſcholar: I know many who have done nothing elſe, and yet I fancy are not one title the wiſer. Perhaps, you expect, before I enter upon my ſubject, I ſhould deſcribe the ſituation and building of the Marchioneſs' ſeat; many great palaces have been turned inſide out upon far leſs occaſion: but I intend to ſave you and myſelf that labour. Suffice it for me to ſay, that I found the lady without company, at which I was not diſpleased: The firſt two days drained me of all the news I brought from Paris. What I now ſend you is aſtronomical converſation; which I will divide into ſo many parts, as we were evenings together.

FIRST EVENING.

That the Earth is a Planet, which turns on itself, and round the Sun.

ONE evening, after ſupper, we went to take a turn in the Park: the air, from the heat of the preceding day, was extremely refreſhing; the moon about an hour high, ſhedding her luſtre among the trees, formed an agreeable mixture of light and darkneſs; the ſtars were arrayed in all their glory, and not a cloud appeared throughout the hemiſphere. I was muſing on this awful proſpect—but who can long contemplate on the moon or ſtars in the company of a pretty woman? I am much miſtaken if that is a time for contemplation. Well, Madam, ſaid I, to the Marchioneſs, is not the night as pleaſant as the day? The day, ſaid ſhe, like a fair beauty, is clear and dazzling; but the night, like a brown one, more ſoft and moving. You are generous, Madam, replied I, to prefer the brown, who have all the charms that belong to the fair: but,

is their any thing more beautiful in nature than the day? the heroines of romances are generally fair; and that beauty muſt be perfect which has all the advantage of imagination. Tell me not, ſaid ſhe, of perfect beauty; nothing can be ſo that is not moving: but ſince you talk of romances, why do lovers in their ſongs and elegies addreſs themſelves to the night? It is the night, Madam, ſaid I, that crowns their joys, and therefore deſerves their thanks. But it is the night, anſwered ſhe, that hears their complaints; and how comes it to paſs the day is ſo little truſted with their ſecrets? I confeſs, Madam, ſaid I, the night has ſomewhat of a more melancholy air than the day; we fancy the ſtars march more ſilently than the ſun, and our thoughts wander with the more liberty, whilſt we think all the world at reſt but ourſelves: beſides, the day is more uniform; we ſee nothing but the ſun, and one light in the firmament; whilſt the night ſhews us variety of objects, and gives us ten thouſand ſtars, which inſpire us with as many pleaſant ideas. What you ſay, ſhe replied, is true; I love the ſtars; there is ſomewhat charming in them, I could almoſt be angry with the ſun for effacing them. And I cannot, ſaid I, pardon him, for keeping all thoſe worlds from my ſight. What

worlds, ſaid ſhe, looking earneſtly upon me, do you mean?

I BEG your pardon, madam, replied I, you have put me upon my folly, and I begin to rave. What folly, ſaid ſhe; I diſcover none? Alas, anſwered I, I am aſhamed, I muſt own it: I have had a ſtrong fancy that every ſtar is a world; I will not ſwear that it is true, but muſt think ſo, becauſe it is ſo pleaſant to believe it; it is a fancy come into my head, which is very diverting. If your folly be ſo diverting, ſaid the Marchioneſs, pray make me ſenſible of it; provided the pleaſure be ſo great, I will believe as much of the ſtars as you would have me. I fear Madam, replied I, it is a converſion you will not reliſh; it is not like reading one of Moliere's plays; it is a pleaſure rather of the fancy than of the judgement. I hope, anſwered ſhe, you do not think me incapable of it; teach me your ſtars, I will ſhew you the contrary. No, no, ſaid I, it ſhall never be ſaid I was talking philoſophy at ten o'clock at night to the moſt amiable creature in the univerſe; find your philoſophers ſomewhere elſe.

But in vain I excuſed myſelf: who could reſiſt ſuch charms? I was forced to yield, and yet I knew not where to begin; for to a perſon who underſtands nothing of natural

philoſophy, you muſt go a great way about to prove that the earth may be a planet, the planets ſo many earths, and all the ſtars worlds: however, to give her a general notion of philoſophy, I at laſt reſolved on this method. All philoſophy, ſaid I, Madam, is founded upon theſe two propoſitions, 1ſt, that we are too ſhort-ſighted, or 2d, that we are too curious; for if our eyes were better than they are, we ſhould ſoon ſee whether the ſtars were worlds or not; and if on the other hand we were leſs curious, we ſhould not care whether the ſtars are worlds or not; which I think is much to the ſame purpoſe. But the buſineſs is, we have a deſire to know more than we ſee: And again, if we could diſcern well what we do ſee, it would be too much known to us: but we ſee things quite otherwiſe than they are. So that your true philoſopher will not believe what he does ſee, and is always conjecturing at what he does not, which is a life not much to be envied. Upon this I fancy to myſelf, that nature very much reſembles an opera; where you ſtand, you do not ſee the ſtage as it really is; but as it is placed with advantage, and all the wheels and movements are hid, to make the repreſentation the more agreeable: Nor do you trouble yourſelf how, or by what means the machines are

moved, though certainly an engineer in the pit is affected with what does not touch you: he is pleaſed with the motion, and is demonſtrating to himſelf on what it depends, and how it came to paſs. This engineer is like a philoſopher, though the difficulty be greater on the philoſopher's part, the machines of the theatre being nothing ſo curious as thoſe of nature, who diſpoſes her wheels and ſprings ſo out of ſight, that we have been long gueſſing at the movement of the univerſe. Suppose then the ſages to be at an opera, i. e. Pythagoras, Plato, Ariſtotle, and all the wiſe men who have made ſuch a noiſe in the world for theſe many ages; we will ſuppoſe them at the repreſentation of Phæton, where they ſee the aſpiring youth lifted up by the winds, but do not diſcover the wires by which he mounts, nor know they any thing of what is done behind the ſcenes. Would you have all theſe Philoſophers own themſelves to be ſtark fools, and confeſs ingeniouſly they do know not how it comes to paſs? No, no, they are not called wiſe men for nothing; though, let me tell you, moſt of their wiſdom depends upon the ignorance of their neighbours. Every man preſently gives his opinion, and how improbable ſoever, there are fools enough of all ſorts to believe them: One tells you Phæton

is drawn up by a hidden magnetic virtue, no matter where it lies; and perhaps the grave gentleman will take pet if you ask him the question. Another says, Phæton is composed of certain numbers that will make him mount; and after all, the philosopher knows no more of those numbers than a sucking child of algebra. A third tells you, Phæton hath a secret love for the top of the theatre, and, like a true lover, cannot be at rest out of his mistress's company, with an hundred such extravagant fancies, that a man must conclude the old sages were very good banterers. But now comes Monsieur Descartes, with some of the moderns, and they tell you Phæton ascends, because a greater weight than he descends, so that now we do not believe a body can move unless it is pushed and forced by another body, and as it were drawn by cords, so that nothing can rise or fall but by means of a counterpoise: to see nature then, as she really is, one must stand behind the scenes at the opera. I perceive, said the lady, philosophy is now become very mechanical. Yes, Madam, replied I, so mechanical, that I fear we shall quickly be ashamed of it; they will have the world to be like a watch, that is very regular, and depends only upon the just disposition of the several parts of the movement.

But pray tell me, Madam, had you not formerly a more ſublime idea of the univerſe? Do not you think then that you honoured it more than it deſerved? for moſt people have the leſs eſteem for it, ſince they have pretended to know it. I am not of their opinion, said ſhe; I value it the more, ſince I know it resembles a watch; and the more plain and eaſy the whole order of nature ſeems, to me it appears to be the more admirable.

I DO not know, ſaid I, who has inſpired you with theſe ſolid notions, but I am certain there are few who have them beſides yourſelf: people generally admire what they do not comprehend; they have a veneration for obſcurity, and look upon nature as a kind of magic, while they do not underſtand her; and deſpiſe her below legerdemain, when once they are acquainted with her; but I find you, Madam, ſo much better diſpoſed, that I have nothing to do but to draw the curtain, and ſhow you the world. That noble expanſe which appears fartheſt from this earth, that azure firmament, where the ſtars are faſtened like ſo many nails, and are called fixed, becauſe they ſeem to have no other motion than that of their horizon, which carries them with itſelf from eaſt to weſt, is called the heavens. Between the

earth and this great vault, as I may call it, hang, at different heights, the ſun, and the moon, with the other five ſtars, Mercury, Venus, Mars, Jupiter, and Saturn, which we call the planets. Theſe planets, not being faſtened to the ſame heaven, and having very unequal motions, have diverſe aſpects and poſitions: whereas the fixed ſtars, in reſpect to one another, are always in the ſame ſituation: for example, the chariot, which you ſee is compoſed of thoſe ſeven ſtars, has been, and ever will be as it now is, though the moon is ſometimes nearer to the ſun, and ſometimes farther from it; and ſo it is with the reſt of the planets. Thus, things appeared to the old Chaldean ſhepherds, whoſe great leiſure produced thoſe obſervations that have ſince been the foundation of aſtronomy; which ſcience had its birth in Chaldea, as geometry ſprung from Egypt; where the inundations of the Nile, confounding the bounds of the fields, occaſioned their inventing more exact meaſures to diſtinguiſh every one's land from that of his neighbour. So that aſtronomy was the daughter of idleneſs, geometry of intereſt; and if we did but examine poetry, we ſhould certainly find her the offspring of love.

I am glad, ſaid the lady, I have learned

the genealogy of the ſciences, and am convinced I muſt ſtick to aſtronomy; my ſoul is not mercenary enough for geometry, nor is it tender enough for poetry; but I have as much time to ſpare as aſtronomy requires; beſides, we are now in the country, and lead a kind of paſtoral life, all which ſuits beſt with aſtronomy. Do not deceive yourſelf, Madam, replied I, it is not a true ſhepherd's life to talk of the ſtars and planets: ſee if they paſs their time ſo in Aſtrea. That ſort of ſhepherd's craft, anſwered ſhe, is too dangerous for me to learn. I love the honeſt Chaldeans, and you muſt teach me their rules, if I am to improve in their ſcience. But let us proceed; when they had placed the heavens in the diſpoſition you tell me, pray, what is the next queſtion? The next, ſaid I, is the diſpoſing of the ſeveral parts of the univerſe, which the learned call, making a ſyſtem. But before I expound the firſt ſyſtem, I would have you obſerve, that we are naturally like the Athenian ideot, who fancied all the ſhips were his which came into Pyreium port: nor is our folly leſs extravagant; we believe all things in nature deſigned for our uſe; and do but ask a philoſopher, to what purpoſe is that prodigious company of fixed ſtars, when a far leſs number would perform

the ſervice they do us? he anſwers coldly, they were made to pleaſe our ſight. Upon this principle they imagined the earth reſted in the centre of the univerſe, while all the celeſtial bodies, which were made for it, took the pains to turn round to give light to it. They placed the moon above the earth, Mercury above the Moon, after Venus the ſun, Mars, Jupiter, Saturn, above all theſe they ſet the heaven of fixed ſtars: the earth was juſt in the middle of thoſe circles which contain the planets; and the greater the circles were, the farther were they diſtant from the earth; and by conſequence the fartheſt planets took up the moſt time in finiſhing their courſe; which in effect is true. But why, ſaid the Marchioneſs, enterrupting me, do you diſlike this ſyſtem? It ſeems to me very clear and intelligible. However, replied I, Madam, I will make it plainer; for ſhould I give it you as it came from Ptolomy, its author, or ſome others who have ſince ſtudied it, I ſhould frighten you, I fancy, inſtead of diverting you. Since the motions of the planets are not ſo regular, but that ſometimes they go faſter, ſometimes ſlower, ſometimes are nearer the earth, and ſometimes farther from it; the ancients invented I do not know how many orbs or circles, involved one with-

in another, which they thought would ſolve all objections. This confuſion of circles was ſo great, that, at the time, when they knew no better, a certain king of Caſtile, a great mathematician, but not much troubled with religion, ſaid, that, had God conſulted him when he made the world, he would have told him how to have framed it better. The ſaying was very atheiſtical, and no doubt the inſtructions he would have given the Almighty, were the ſuppreſſing thoſe circles with which he had clogged the celeſtial motions, and the taking away two or three ſuperfluous heavens, which were placed above the fixed ſtars; for the philoſophers, to explain the motion of the celeſtial bodies, had above the uppermoſt heaven, which we ſee, found another of cryſtal, to influence and give motion to the inferior heavens; and where-ever they heard of another motion, they preſently clapped up a cryſtal heaven, which coſt them nothing. But why, ſaid the lady, muſt their heaven be of cryſtal, would nothing elſe ſerve as well? No, no, replied I, nothing ſo well; for the light is to come through them, and yet they are to be ſolid. Ariſtotle would have it ſo, he had found ſolidity to be one of their excellencies, and when he had once ſaid it, no body would be ſo rude as to queſtion him.

But it ſeems there were comets much higher than the philoſophers expected, which, as they paſſed along, broke the cryſtal heavens, and confounded the univerſe. But to make the beſt of a bad market, they preſently melted down their broken glaſs, and to Ariſtotle's confuſion, made the heaven fluid; and by the obſervations of theſe latter ages, it is now out of doubt that Venus and Mercury turn round the ſun, and not round the earth, according to the ancient ſyſtem, which is now entirely exploded, and all the authorities not worth a ruſh. But that which I am going to lay down will ſolve all, and is ſo clear, that the King of Caſtile himſelf may ſpare his advice. Methinks, ſaid the Marchioneſs, your philoſophy is a kind of out-cry, where he that offers to do the work cheapeſt carries it from all the reſt. This, ſaid I, is very true; nature is a great houſewife, ſhe always makes uſe of what coſts leaſt, let the difference be ever ſo inconſiderable; and yet this frugality is accompanied with an extraordinary magnificence, which ſhines through all her works; that is, ſhe is magnificent in the deſign, but frugal in the execution; and what can be more praiſe worthy than a great deſign accompliſhed with a little expence? But in our ideas we turn things topſy-turvy, we place

our thrift in the deſign, and are at ten times more charge in workmanſhip than it requires; which is very ridiculous. Imitate nature then, replied ſhe, in your ſyſtem, and give me as little trouble as you can to comprehend you. Madam, ſaid I, fear it not, we have done with our impertinences: imagine then a German, called Copernicus, confounding every thing, tearing in pieces the beloved circles of antiquity, and ſhattering their cryſtal heavens like ſo many panes of glaſs; ſeized with the noble rage of aſtronomy, he ſnatches up the earth from the centre of the univerſe, ſends her packing, and places the ſun in the centre, to which it did more juſtly belong; the planets no longer turn round the earth, nor incloſe it in the circles they deſcribe; if they give us light, it is but by chance, and as they meet us in their way: all now turns round the ſun, even the earth herſelf; and Copernicus, to puniſh the earth for her former lazineſs, makes her contribute all he can to the motion of the planets and heavens; and now ſtripped of all the heavenly equipage with which ſhe was ſo gloriouſly attended, ſhe has nothing left her but the moon, which ſtill turns round about her. Fair and ſoftly, replied the Marchioneſs; I fancy you yourſelf are ſeized with the noble fury of aſtronomy; a little

lets rapture, and I ſhall underſtand you the better. The ſun, you affirm, is in the centre of the univerſe, and is immoveable; what follows next? It is Mercury, ſaid I, he turns round the ſun, ſo that the ſun is the centre of the circle wherein Mercury moves; above Mercury is Venus, who turns alſo round the ſun; after, comes the earth, which being placed higher than Mercury and Venus, makes a greater circle round the ſun than either of them; at laſt comes Mars, Jupiter, and Saturn, in the ſame order I name them; ſo that Saturn has the greateſt circle round the ſun, which is the reaſon he is longer in making his revolution than any of the other planets. You have forgot the moon, ſaid the Marchioneſs. We ſhall quickly find her again, replied I: the moon turns round the earth, and does not leave her, but as the earth advances in the circle, which ſhe describes about the ſun; and if the moon turns round the ſun, it is becauſe ſhe will not quit the earth. I underſtand you, ſaid ſhe, and I love the moon for ſtaying with us when all the other planets abandon us: nay, I fear your German would have willingly taken her away too if he could; for in all his proceedings, I find he had a great ſpite to the earth. It was well done of him, ſaid I, to abate the vanity of man-

kind, who had taken up the beſt place in the univerſe; and it pleaſes me to ſee the earth in the crowds of planets. Sure, anſwered ſhe, you do not think their vanity extends itſelf ſo far as aſtronomy! Do you believe you have humbled me, in telling me the earth goes round the ſun? For my part, I do not think myſelf the worſe for it. I confeſs, Madam, ſaid I, it is my belief that a fair lady would be much more concerned for her place at a ball, than for her rank in the univerſe; and the precedence of two planets will not make half ſuch a noiſe in the world as that of two ambaſſadors; however, the ſame inclination which reigns at a ceremony governs in a ſyſtem; and if you love the uppermoſt place in the one, the philoſopher deſires the centre in the other; he flatters himſelf that all things were made for him, and inſenſibly believes a matter of pure ſpeculation to be a point of intereſt. This is a calumny, ſaid ſhe, you have invented againſt mankind; why did they receive this ſyſtem if it was ſo erroneous? I know not, anſwered I, but I am ſure Copernicus himſelf diſtributed the ſucceſs of his opinion; it was a long time before he would venture to publiſh it; nor had he done it then without the importunity of his friends. But do you know what became of him? the

very day they brought him the firſt printed ſheet of his book, he died; foreſeeing that he ſhould never be able to reconcile all the contradictions, and therefore very wiſely ſtept out of the way. I would be juſt to all the world, ſaid the lady, but it is hard to fancy we move, and yet find we do not change our place; we perceive our ourſelves in the morning where we lay down at night: perhaps you will tell me the whole earth moves. Yes, certainly, added I; it is the ſame caſe as if you fell aſleep in a boat upon the river; when you awake you find yourſelf in the ſame place, and the ſame ſituation, in reſpect to all the parts of the boat. It is true, ſaid ſhe, but there is a great difference; when I wake I find another ſhore, and that ſhows me my boat has changed its place. But it is not the ſame with the earth. I find all things as I left them. No, no, ſaid I, there is another ſhore too; you know, that beyond the circles of the planets are fixed ſtars; there is our ſhore. I am upon the earth, and the earth makes a great circle round the ſun; I look for the centre of the circle, and ſee the ſun there; then I direct my ſight beyond the ſun in a right line, and ſhould certainly diſcover the fixed ſtars, which anſwer to the ſun, but that the light of the ſun

effaces them: but at night I eaſily perceive the ſtars that correſponded with him in the day, which is exactly the ſame thing; if the earth did not change its place in the circle where it is, I ſhould ſee the ſun always againſt the ſame fixed ſtars; but when the earth changes its place, the ſun muſt anſwer to other ſtars; and there again is your ſhore, which is always changing. And ſeeing the earth makes her circle in a year, I ſee the ſun likewiſe in the ſpace of a year anſwer ſucceſſively to the whole circle of the fixed ſtars, which circle is called the zodiac. I will draw you the figure of it, if you pleaſe, on the ſand. It is no matter, ſaid the lady, I can do well enough without it; beſides, it will give an air of learning to my park, which I would not have in it: for I have heard of a certain philoſopher, who being ſhipwrecked upon an unknown iſland, ſeeing ſeveral mathematical figures traced on the ſea-ſhore, cried out to thoſe who followed him, courage, my companions, the iſle is inhabited, behold the footſteps of men. But you may ſpare your figures, ſuch footſteps are not decent here.

I confeſs, madam, added I, the footſteps of lovers would better become this place; that is, your name and cypher carved on the trees by your adorers. Tell me not, ſaid

ſhe, of lovers and adorers. I am for my beloved ſun and planets: but how comes it to paſs, that the ſun, as to the fixed ſtars, completes his courſe but in a year, and yet goes over our heads every day? Did you never, ſaid I, obſerve a bowl on the green? It runs towards the jack, and at the ſame time turns very often round itſelf: ſo that the parts which were above, are below; and thoſe which were below are above. Juſt ſo it is with the earth: at the ſame time that ſhe advances in the circle, which in a year's ſpace ſhe makes round the ſun, in twenty-four hours ſhe turns round herſelf; ſo that in twenty-four hours every part of the earth loſes the ſun, and recovers him again; and as it turns towards the ſun, it ſeems to riſe, and as it turns from him, it ſeems to fall. It is very pleaſant, ſaid ſhe, that the earth muſt take all upon herſelf, and the ſun do nothing: and when the moon, the other planets, and the fixed ſtars, ſeem to go over our heads every twenty-four hours, you will ſay, that too is only fancy. Mere fancy, Madam, which proceeds from the ſame cauſe: for the planets complete their courſes round the ſun at unequal times, according to their unequal diſtances; and that which to-day we ſee anſwer to a certain point in the zodiac, or circle of the fixed ſtars, to morrow

will anſwer to another point, becauſe it is advanced on its own circle, as well as we are advanced upon ours: we move, and the planets move too, but with more or leſs rapidity than we do; this puts us in different points of ſight in reſpect to them, and makes us think their courſes irregular. But there is no occaſion of diſcourſing to you on that head: it is ſufficient to inform you, that what ſeems irregular in the planets proceeds only from our motion, when in truth they are all very regular. I will ſuppoſe them ſo, ſaid the lady: but I would not have their regularity put the earth to ſo great trouble; methinks, you exact too much activity from ſo ponderous a maſs. But, ſaid I, had you rather that the ſun and all the ſtars, which are vaſt great bodies, ſhould in twenty-four hours make a prodigious tour round the earth; and that the fixed ſtars, which are in a circle of infinite extent, whoſe movement is always extreme, ſhould run in a day 300,000,000 of leagues, and go farther than from hence to China, in the time that you would ſay,' a-' way, quick to China,' as they needs muſt, if the earth did not turn round itſelf every twenty-four hours? To ſay the truth, it is much more reaſonable to think that ſhe ſhould make the tour, which at moſt is not above 9000 leagues; you perceive plainly, that to

ſet 9000 leagues againſt 300,000,000, is no trifling difference. Oh, ſaid ſhe, the ſun and ſtars are all fire, their motion is not very ſlow; but the earth, I fancy, is a little unwieldy. That, replied I, ſignifies nothing; for what think you of a firſt rate ſhip, which carries 150 guns, and above 3000 men, beſides great quantities of merchandiſe? one puff of wind, you ſee, ſets her a-ſailing, becauſe the water is liquid, and being eaſily ſeparated, very little reſiſts the motion of the ſhip: or if ſhe lie in the middle of a river, ſhe will without difficulty drive with the ſtream, becauſe there is nothing to oppoſe her courſe. So the earth, though never ſo weighty, is as eaſily born up by the celeſtial matter, which is a thouſand times more fluid than the water, and fills all that great ſpace where the planets float; for how elſe would you have the earth faſtened to reſiſt the motion of the celeſtial matter, and not be driven by it? You may as well fancy a little block of wood can withſtand the current of a river. But pray, ſaid ſhe, how can the earth, with all its weight, be born up by your celeſtial matter, which muſt be very light, becauſe it is ſo fluid? It does not argue, anſwered I, that what is moſt fluid, is moſt light: for what think you of the great ſhip I mentioned juſt now, which, with all its burden is yet

lighter than the water it floats on? I will have nothing to do with the great ship, said she, with some warmth; and I begin to apprehend myself in some danger upon such a whirligig as you have made of the earth. There is no danger, said I; but, Madam, if your fears increase, we will have the earth supported by your elephants, as the Indians believe it. Hey day, cried she, here is another system; however, I love those people for taking care of themselves; they have a good foundation to trust to, while we Copernicians are a little too ventrous with the celestial matter; and yet I fancy, if the Indians thought the earth in the least danger of sinking they would double their number of elephants.

They do well, said I, laughing at her fancy, who would sleep in fear. And if you have occasion for them to night, we will put as many as you please in our system; we can take them away again by degrees, as you grow better confirmed. I do not think them very necessary, said she. I have courage enough to turn. You shall turn with pleasure, Madam, said I, and shall find delightful ideas in this system. For example, sometimes I fancy myself suspended in the air, without any motion, while the earth turns round me in twenty four hours; I see, I know

not how many different faces paſs under me, ſome white, ſome black, and ſome tawny; ſometimes I ſee hats, and ſometimes turbants; now heads of hair, and then bald pates; here I ſee cities with ſteeples, ſome with ſpires and creſcents, others with towers of porcelain; and, anon, great countries with nothing but huts; here I ſee vaſt oceans, and there moſt horrible deſarts; in ſhort, I diſcover the infinite variety which is upon the ſurface of the earth.

I confeſs, ſaid ſhe, twenty-four hours would thus be very well beſtowed, ſo we were in the ſame place where we are now; I do not mean in the park, but we will ſuppoſe ourſelves in the air, other people continually paſſing by, who take up our place, and at the end of twenty-four hours we return to it again.

Copernicus himſelf, anſwered I, could not have comprehended it better; firſt then we might ſee the Engliſh paſſing by us, up to the ears in politics, yet ſettling the nation no better than we do the world in the moon; then follows a great ſea, and there perhaps ſome veſſel, not near in that tranquillity as we are; then come ſome of the Iroquois going to eat a priſoner for their breakfaſt, who ſeems as little concerned as his devourers.

After appear the women of the land of

Jeſſo, who ſpend all their time in dreſſing proviſions for their husbands, and painting their lips and eye brows blue, only to pleaſe the greateſt brutes in the world: then the Tartars going devoutly on pilgrimage to the great Preſter John, who never comes out of a gloomy apartment, all hung with lamps, by the light of which they pay their adoration to him: then the fair Circaſſians, who make no ſcruple of granting every thing to the firſt comer, except what they think eſſentially belongs to their husbands: then the inhabitants of little Tartary, going to ſteal concubines for the Turks and Perſians; and at laſt, our own dear countrymen, it may be, in ſome points, as ridiculous as the beſt of them.

This, ſaid the Marchioneſs, is very pleaſant; but, to imagine what you tell me, though I were above, and ſaw all this, I would have the liberty to haſten or retard the motion of the earth, according as the objects pleaſed me more or leſs; and I aſſure you I ſhould quickly ſend packing the politicians and men-eaters, but ſhould have a great curioſity for the fair Circaſſians; for methinks they have a cuſtom very particular. But I have a difficulty to ſolve, and you muſt be ſerious. As the earth moves, the air changes every moment, ſo we breath

the air of another country. Not at all, replied I; for the air which encompaſſes the earth does not extend above a certain height, perhaps twenty leagues; it follows us and turns with us: have you not ſeen the labour of the ſilk-worm, the ſhells which thoſe little inſects impriſon themſelves in, and weave with ſo much art and cloſeneſs; but yet their covering is of a down, very looſe and ſoft; ſo the earth, which is ſolid, is covered from the ſurface twenty leagues upwards with a kind of down, which is the air, and like the ſhell of the ſilk-worm turns at the ſame time. Beyond the air is the celeſtial matter, incomparably more pure and ſubtle, and much more agitated than the air.

Your compariſon, ſaid ſhe, is ſomewhat low, and yet what wonders are wrought, what wars, what changes, in this little ſhell? It is true, replied I; but nature takes no notice of ſuch minute particular motions, but drives us along with the general motions, as if ſhe were at bowls.

Methinks, ſaid ſhe, it is very ridiculous to be upon a thing that turns, and be in all this perplexity, and yet not be well aſſured that it does turn; and to tell you the truth, I begin to diſtruſt the reaſons you give why we ſhould not be ſenſible of the motion of the earth; for it is poſſible there ſhould not

be ſome little mark left by which we might perceive it ?

All motions, replied I, the more common and natural they are, are the leſs perceptible; and this holds true even in morality: the motion of ſelf-love is ſo natural to us, that for the moſt part we are not ſenſible of it, and we believe we act by other principles. Ah ! ſaid the Marchioneſs, now are you moralizing to a queſtion of natural philoſophy, which is running wide of the argument : but enough, this lecture is ſufficient for the firſt time ; let us now depart, and meet here again to morrow, you with your ſyſtems, and I with my ignorance.

In returning back to the caſtle, that I might ſay all I could on the ſubject, I told her of a third ſyſtem invented by Tycho-Brache, who had fixed the earth in the centre of the world, turned the ſun round the earth, and the reſt of the planets round the ſun ; for ſince the new diſcoveries, there was no way left to have the planets turn round the earth. But the lady, with the quickeſt apprehenſion, replied, ſhe thought that too affected a ſyſtem, that among ſo many great bodies, the earth only ſhould be exempted from turning round the ſun ; that it was improper to make the ſun turn round the earth, when all the planets turn round the ſun; and

that though this ſyſtem was to prove the immobility of the earth, yet ſhe thought it very improbable: ſo we reſolved to ſtick to Copernicus, whoſe opinion we thought moſt uniform, probable, and diverting. In a word, the ſimplicity of his ſyſtem convinces us, and the boldneſs of it ſurpriſes with pleaſure.

THE SECOND EVENING.

That the Moon is an Habitable World

THE next morning, as ſoon as any one could get admittance, I ſent to the Marchioneſs's apartment, to know how ſhe had reſted, and whether the motion of the earth had not disturbed her? She returned for anſwer, that ſhe began to be accuſtomed to it, and that Copernicus himſelf had not ſlept better. Soon after, there came ſome neighbours to dinner, who ſtaid with her till the evening, according to a tireſome rural cuſtom; nay, and they were very obliging in going then, for the country likewiſe gives a privilege of extending their viſits to the next morning, if they be ſo diſpoſed, and have not the conſcience to break up. The Marchioneſs and I, finding ourſelves at liberty in the evening, went again to the park, and immediately fell upon our ſyſtems: ſhe ſo well retained what I told her the night be-

fore, that ſhe deſired I would proceed, without any repetition. Well, Madam, ſaid I, ſince the ſun, which is now immoveable, has left off being a planet, and the earth, which turns round him is now become one, you will not be ſurpriſed when you hear that the moon is an earth too, and a habitable world. I confeſs, ſaid ſhe, I have often heard talk of the world in the moon, but I always looked upon it as viſionary, and mere fancy. And, replied I, it may be ſo ſtill; I am in this caſe, as people in a civil war, where the uncertainty of what may happen makes them hold intelligence with the oppoſite party, and correſpond with their very enemies; for though I do verily believe the moon is inhabited, I live civilly with thoſe who do not believe it; and I am, like ſome honeſt gentlemen in point of religion, ſtill ready to embrace the prevailing opinion; but till the unbelievers have a more conſiderable advantage, I declare for the inhabitants of the moon.

Suppoſe there had never been any communication between Paris and St. Dennis, and one, who was never beyond the walls of this city, ſaw St. Dennis from the towers of Notre-Dame; you aſk him if he believes St. Dennis is inhabited as Paris is? He preſently anſwers boldly, No; for ſaid he, I ſee ve-

ry well the people at Paris, but thoſe at St. Dennis I do not ſee at all, nor did I ever hear of any there: it is true, you tell him, that from the towers of Notre-Dame he cannot perceive any inhabitants of St. Dennis, becauſe of the diſtance; but all that he does diſcover of St. Dennis, very much reſembles what he ſees at Paris, the ſteeples, houſes, and walls, ſo that it may very well be inhabited as Paris is. All this ſignifies nothing; my cockney ſtill maintains that St. Dennis is not inhabited, becauſe he ſees no body there. The moon is our St. Dennis, and every one of us like this Pariſian cockney, who never went out of his own city.

You are too ſevere, ſays ſhe, upon your fellow citizens; we are not all ſure ſo ſilly as the cockney; ſince St. Dennis is juſt like Paris, he is a fool if he does not think it inhabited: but the moon is not at all like the earth. Take care what you ſay, Madam, replied I, for the moon reſembles the earth, you are under a neceſſity to believe it inhabited. If it be ſo, ſaid ſhe, I own I cannot be diſpenſed from believing it; and you ſeem ſo confident of it, that I fear I muſt whether I will or no. It is true, the two motions of the earth, (which I could never imagine till now) do a little ſtagger me as to all the reſt; but yet, how is it poſſible the earth ſhould

enlighten as the moon does, without which they cannot be alike ? If that be all, added I, the difference is not great ; for it is the ſun which is the ſole fountain of light ; that quality proceeds only from him; and if the planets give light to us, it is becauſe they firſt receive it from the ſun ; the ſun ſends light to the moon, and ſhe reflects it back on the earth; the earth in the ſame manner receives light from the ſun, and ſends it to the moon; for the diſtance is the ſame between the earth and the moon, as between the moon and the earth.

But, ſaid the Marchioneſs, is the earth as fit to ſend back the light of the ſun as the moon is ? You are altogether for the moon, ſaid I ; ſhe is much obliged to you; but you muſt know that light is made up of certain little balls, which rebound from what is ſolid, but paſs through what admits of an entrance in a right line, as air or glaſs: ſo that what makes the moon enlighten us is, that ſhe is a firm and ſolid body, from which the little balls rebound : and we muſt deny our ſenſes, if we will not allow the earth the ſame ſolidity : in ſhort, the difference is how we are ſeated; for the moon being at ſo vaſt a diſtance from us, we can only diſcover her to be a body of light, and do not perceive that ſhe is a great maſs, altogether like the earth

whereas, on the contrary, becauſe we are ſo near the earth, we know her to be a great maſs, proper for the furniſhing proviſion for animals; but do not diſcover her to be a body of light, for want of the due diſtance. It is juſt ſo with us all, ſaid the lady; we are dazzled with the quality and fortune of thoſe who are above us, when, did we but examine things nicely, we ſhould find ourſelves upon a level.

It is the very ſame thing, ſaid I, we would judge of all things, but yet ſtand in the wrong place; we are too near to judge of ourſelves, and too far off to know others; ſo that the true way to ſee things as they are, is to ſtand between the moon and the earth; to be purely a ſpectator of this world, and not an inhabitant. I ſhall never be ſatisfied, ſaid ſhe, for the injuſtice we do the earth, and the too favourable opinion we have of the moon, till you aſſure me that the inhabitants of the moon are as little acquainted with their own advantages as we are with ours: and that they take our earth for a planet, without knowing theirs is one too. Do not doubt it, anſwered I; we appear to them to perform very regularly our functions of a planet: it is true, they do not ſee us make a circle round them, but that is no great matter. That half of the moon which was turn-

ed towards us at the beginning of the world, has been turned towards us ever ſince; and thoſe ſpots in her, which we have fancied look like a face, with eyes, noſe, and mouth, are ſtill the ſame; and if the oppoſite half ſhould appear to us, we ſhould, no doubt, fancy another figure, from the different ſpots that are in it: not but that the moon turns upon herſelf, and in the ſame time that ſhe turns round the earth, that is in a month; but while ſhe is making that turn upon herſelf, and that ſhe ſhould hide a cheek, for example, and appear ſomewhat elſe to us, ſhe makes a like part of her circle round the earth, and ſtill preſents to us the ſame cheek; ſo that the moon, who in reſpect of the ſun and ſtars turns round herſelf, in reſpect of us does not turn at all; they ſeem to her to riſe and ſet in the ſpace of fifteen days; but for our earth it appears to her to be held up in the ſame place of the heavens. It is true, this apparent immobility is not very agreeable to a body which ſhould paſs for a planet, but it is not altogether perfect; the moon has a kind of trembling, which cauſes a little corner of her face to be ſometimes hid from us, and a little corner of the oppoſite half appears; but then, upon my word, ſhe attributes that trembling to us, and fancies that we have in the heavens

the motion of a pendulum, which vibrates to and fro.

I find, said the Marchioness, the planets are just like us; we cast that upon others which is in ourselves. Says the earth, it is not I that turn, it is the sun. Says the moon, it is not I that shake, it is the earth. The world is full of error. But I would not advise you, Madam, to undertake the reforming it; you had better convince yourself of the entire resemblance of the earth and the moon: imagine then these two great bowls suspended in the heavens: you know that the sun always enlightens the one half of a body that is round, and the other half is in the shadow; there is then one half of the earth, and one half of the moon, which is enlightened by the sun; that is, one half which is day, and the other half, which is night. Observe also, that as a ball has less force after it has been struck against a wall, and rebounds to the other side, so is light weakened when it is reflected. The pale light, which comes to us from the moon, is the very light of the sun; but it cannot come to us from the moon, but by reflection; it has lost much of the force and lustre it had when it came directly from the sun upon the moon; and that bright light, which shines directly upon us from the sun, and which the

earth reflects upon the moon, is pale and weak when it arrives there ; so that the light which appears to us in the moon, and enlightens our nights, is the part of the moon which has day, and that part of the earth which has day, when it is opposite to the part of the moon which has night, gives light to it ; all depends upon this, how the moon and the earth behold one another. At the beginning of the month we do not see the moon, because she is between the sun and us ; that half of her which has day is then turned towards the sun : and that half which has night, is turned towards us ; we cannot see it then, because it has no light upon it ; but that half of the moon which has night, being turned to that half of the earth which has day, sees us without being perceived, and we then appear to them just as the full moon does to us ; so that, as I may say, the inhabitants of the moon, have then a full earth; but the moon, being advanced upon her circle of a month, comes from under the sun, and begins to turn towards us a little corner of that half which is light, which is the crescent; then those parts of the moon which have night do not see all that half of the earth which has day ; we are then in the wain to them.

I understand you perfectly, said the Marchioness, without hesitation. I can compre-

hend the reſt at pleaſure, and I have nothing to do but think a moment, and bring the moon upon her circle of a month. I ſee, in general, that the inhabitants of the moon have a month quite contrary to us; when we have a full moon, their half of the moon, which is light, is turned to our half of the earth which is dark; they do not ſee us at all, and they have then a new earth; this is plain. I would not ſtand the reproach of requiring a long explication of ſo eaſy a point: but now tell me, how come the eclipſes? You may eaſily gueſs that, Madam; when it is new moon, ſhe is between the ſun and us, and all her dark half is turned towards us who have light; that obſcure ſhadow is caſt upon us; if the moon be directly under the ſun, the ſhadow hides him from us, and at the ſame time obſcures a part of that half of the earth which is light; this is ſeen by that half of the moon which is dark; here then is an eclipſe of the ſun to us during our day, and an eclipſe of the earth to the moon during her night. When it is full moon, the earth is between her and the ſun, and all the dark half of the earth is turned towards all the light half of the moon; the ſhadow then of the earth caſts itſelf towards the moon, and if it falls on the moon, it obſcures that light half which we ſee, which then has day, and hin-

ders the ſun from ſhining on it ; here then is an eclipſe of the moon to us during our night, and an eclipſe of the ſun to the moon during her day : but the reaſon that we have not eclipſes every time that the moon is between the ſun and the earth, or the earth between the ſun and moon, is becauſe theſe three bodies are not exactly placed in a right line, and by conſequence that which ſhould make the eclipſe, caſts its ſhadow a little beſide that which ſhould be obſcured.

I am greatly ſurpriſed, ſaid the Marchioneſs, that there ſhould be ſo little myſtery in eclipſes, and that the whole world ſhould not know the cauſe of them. They never will, ſaid I, as ſome folks go about it. In the Eaſt Indies, when the ſun and moon are in eclipſe, they believe a certain demon, who has black claws, is ſeizing on thoſe planets with his talons ; and during that time, the rivers are covered with the heads of Indians, who are up to the neck in water, becauſe they eſteem it a very devout poſture, to implore the ſun and moon to defend them againſt the devil. In America they are perſuaded that the ſun and moon, when eclipſed, are angry ; and what is it they will not do to be reconciled with them ? The Greeks, who were ſo refined a people, believed the moon was then inchanted, and that the magicians

forced her to deſcend from heaven, and ſhed a malignant juice on the plants; nay, what a panic were we in not many years ago at an eclipſe of the ſun, when people hid themſelves in cellars, and all the philoſophers, who treated of its cauſe, could not perſuade them to come out till the eclipſe was over?

In good truth, ſaid the lady, it is ſcandalous for men to be ſuch cowards: there ought to be a law made to prohibit the diſcourſing of eclipſes, that we might not call to mind the follies which have been occaſioned thereby. Your law then, ſaid I, muſt aboliſh even the memory of every thing, and forbid us to ſpeak at all; for I know nothing in the world which is not a monument of the folly of man.

But what do you think, added ſhe, of the inhabitants of the moon? are they as fearful of an eclipſe as we are? It would be a very good jeſt to ſee the Indians there up to the neck in water; that the Americans ſhould believe the earth angry with them; the Greeks fancy we were bewitched, and would deſtroy their plants; in ſhort, that we ſhould cauſe the ſame conſternation among them, as they do among us. Why not, Madam, I do not at all doubt of it; why ſhould the people in the moon have more wit then we? what right have they to fright us, and not we them?

For my part, continued I laughing, I believe, that ſince a prodigious company of men have been, and ſtill are, ſuch fools to adore the moon, there certainly are people in the moon who worſhip the earth, and we really are upon our knees the one to the other. But ſure, ſaid ſhe, we do not pretend to ſend any influences to the moon, and to give a criſis to her ſick; if the people have any wit in thoſe parts, they will ſoon deſtroy the honour we flatter ourſelves with, and, I fear, we ſhall have the diſadvantage.

Madam, ſaid I, pray fear not that, do you think we are the only fools of the univerſe? Is it not common for ignorance to ſpread itſelf every where? It is true, we can only gueſs at the folly of the people in the moon, but I no more doubt it, than I do the moſt authentic news that comes from thence. What authentic news comes from thence, ſaid ſhe? That which the learned bring us, replied I, who travel thither every day with their tubes and telescopes; they will tell you of their diſcoveries there, of lands, ſeas, lakes, high mountains, and deep abyſſes.

Indeed, anſwered ſhe, I fancy they may diſcover mountains and abyſſes, becauſe of the remarkable inequality; but how do they diſtinguiſh lands and ſeas? Very eaſily, Madam, for the waters letting part of the light

paſs through them, ſend back but a very little, ſo that they appear afar off like ſo many dark ſpots; whereas the lands, being ſolid, reflect the whole light, and appear to be more bright and ſhining. The illuſtrious Monſieur Caſſini, a moſt complete aſtronomer, has diſcovered in the moon ſomething which divided, then re-united, and ſunk in a kind of well: we may very probably ſuppoſe this was a river. Nay, they pretend to be ſo well acquainted with the ſeveral places, that they have given them all names; one they call Copernicus, another Archimedes, and a third Galileus; there is the Caſpian Sea, the Black Lake, the Porphyrite mountains; in ſhort, they have publiſhed ſuch exact deſcriptions of the moon, that a mere almanac-maker will be no more to ſeek there, than I am in Paris,

I muſt own then, ſaid the Marchioneſs, they are very exact; but what they ſay to the inſide of the country I would very fain know. It is impoſſible, replied I, the moſt learned aſtronomers of our age cannot inform you. You muſt aſk Aſtolfo this queſtion, who was carried into the moon by St John. I am going to tell you one of the agreeable follies of Arioſto, which I am ſure you will be well pleaſed to hear: I muſt confeſs he had better have let St. John alone, whoſe

name is so worthy of respect; but it is a poetical licence, and must be allowed. The poem, which is called Orlando Furioso, is dedicated to a cardinal, and a great Pope has honoured it with his approbation, which is prefixed to several of the editions: this is the argument.

ORLANDO, nephew to Charlemagne, runs mad, because the fair Angelica prefers Medoro to him. Astolfo, a knight-errant, finding himself one day in the terrestrial paradise, which was upon the top of a very high mountain, where he was carried by his flying horse, meets St. John there, who tells him, if he would have Orlando cured, he must make a voyage with him into the moon. Astolfo, who had a great mind to see new countries, did not stand much upon intreaty: there immediately came a fiery-chariot, which carried the apostle and the knight up into the air. Astolfo being no great philosopher, was surprised to find the moon so much bigger than it appeared to him when he was upon the earth: to see rivers, seas, mountains, cities, forests; nay, what would have surprised me too, nymphs hunting in those forests: but that which appeared most remarkable, was a valley where you might find any thing that was lost in our world, of what nature soever, crowns, riches, fame, and an infinity of hopes: the time we spend in play, and in searching for the philosopher's stone, the alms we give after our death, the verses we present to great men and princes, and the sighs of lovers.

I do not know, said the Marchioness, what became of the sighs of lovers in Ariosto's time, but I fancy there are very few of them

aſcend to the moon in our days. Ah, Madam, replied I, how many does your ladyſhip ſend thither every day? Thoſe that are addreſſed to you will make a conſiderable heap; and I aſſure you the moon keeps all ſafe that is loſt here below: Yet I muſt tell you, Arioſto does but whiſper it; though every thing is there, even the donation of Conſtantine; (the popes having pretended to be maſters of Rome and Italy, by virtue of a donation which the Emperor Conſtantine made Silveſter; and the truth of it is, no boby knows what is become of it:) but what do you think is not to be found in the moon? Folly: all that ever was upon the earth is kept there ſtill; but in lieu of it, it is not to be imagined how many wits, if I may ſo call them, that are loſt here, are got up into the moon; they are ſo many phials full of a very ſubtile liquor, which evaporates immediately, if it be not well ſtopped; and upon every one of theſe phials the names are written to whom the wits belong: I thiuk Arioſto has heaped them one upon another a little confusedly, but for order ſake we will fancy them placed upon ſhelves in a long gallary. Aſtolfo wondered to ſee ſeveral phials full, inſcribed with the names of perſons whom he thought conſiderable for their wiſdom. To confeſs the truth, I begin to fear, ſince I

have entertained you with theſe philoſophical and poetical viſions, mine there is not very empty; however, it is ſome conſolation to me, that while you are ſo attentive, you have a little glaſs full, as well as your humble ſervant: the good knight found his own wits among the reſt, and with St. John's leave, ſnuffed it all up his noſe, like ſo much Hungary water; but Arioſto ſaid he did not carry it far, it returned again to the moon a little after.

The love of one fair northern lass,
Sent back his wit unto the place it was.

Well, he did not forget Orlando's phial, which was the occaſion of his voyage; but he was curſedly plagued to carry it, for the hero's wits were naturally very heavy, and there did not want one drop of it: to conclude, Arioſto, according to his laudable cuſtom of ſaying whatever he pleaſes, addreſſes himſelf to his miſtreſs in the following beautiful verſes.

Ah! who, my fair, will wing his flight ſo high
To fetch my wandering wits from yonder ſky;
My wits, ſtill waſting, ſince the fatal dart
Came from thoſe lovely eyes to pierce my heart?
Nor will I yet of baniſh'd ſenſe complain,
Let me the little I've preſerv'd retain:
But thus decreaſing ſtill, when all is flown
I in Orlando's fate may paint my own.

Yet, to retrieve my loſs, I need not ſoar
So far from earth, or Paradiſe explore;
Or to the circle of the moon repair;
My waining wits are never treaſur'd there;
No—in your eyes, your lovely face they ſtray,
Your ivory neck, your boſom's milky way;
Then let theſe lips your favouring grace obtain
To ſearch thoſe charms till I grow wiſe again.

Is not this very merry? To reaſon like Arioſto, the ſafeſt way of loſing our wits, is to be in love; for you ſee they do not go far from us, we may recover them again at our lips; but when we loſe them by other means, as for example, by philoſophyzing, they are gone with a jerk into the moon, and there is no coming at them again when we would. However, ſaid the Marchioneſs, our phials have an honourable ſtation among the philoſophers, among whom it is forty to one, but love fixes our wits on an object we cannot but be aſhamed of: but to take away mine entirely, pray tell me very ſeriouſly, if you believe there are any men in the moon, for, methinks, hitherto you have not been very poſitive. For my part, ſaid I, I don't believe there are men in the moon; do but obſerve how much the face of nature is changed between this and China; other viſages, ſhapes, manners; nay, almoſt other principles of reaſon; and therefore between us and the moon

the alteration muſt be much more conſiderable. In the lands that have been lately diſcovered, we can ſcarce call the inhabitants men, they are rather animals in human ſhape, and that too ſometimes very imperfect, almoſt without human reaſon; he therefore who will travel to the moon, muſt not expect to find men there.

What ſort of people are they then, ſaid her Ladyſhip, with an air of impatience? Troth Madam, replied I, I do not know; for put the caſe that we ourſelves inhabited the moon, and were not men, but rational creatures; could we imagine, do you think, ſuch fantaſtical people upon the earth, as mankind is? Is it poſſible we ſhould have an idea of ſo ſtrange a compoſition, a creature of ſuch fooliſh paſſions, and ſuch wiſe reflections; allotted ſo ſmall a ſpan of life, and yet purſuing views of ſuch extent? ſo learned in trifles, and ſo ſtupidly ignorant in matters of the greateſt importance? ſo much concerned for liberty, and yet ſuch great inclination to ſervitude? ſo deſirous of happineſs, and yet ſo very incapable of attaining it? The people in the moon muſt be wiſe indeed to ſuppoſe all this of us. But do not we ſee ourſelves continually, and cannot ſo much as gueſs how we were made? So that we are forced to ſay, the gods when they created

us were drunk with nectar; and when they were ſober again, could not chuſe but laugh at their own handy-work. Well, well, ſaid the Marchioneſs, then, we are ſafe enough, the inhabitants of the moon know nothing of us, but I could wiſh we were a little better acquainted with them; for it troubles me that we ſhould ſee the moon above us, and yet not know what is done there. Why, ſaid I, are not you as much concerned for that part of the earth which is not yet diſcovered? what creatures inhabit it, and what they do there? For they and we are aboard the ſame ſhip; they poſſeſs the prow, and we the poop, and yet there is no manner of communication between us: they know not at one end of the veſſel, who lives, or what is done at the other; and you would know what paſſes in the moon, which is another great ſhip, ſailing in the heavens at a vaſt diſtance from us.

Oh, ſaid ſhe, as for the earth, I reckon it all as good as diſcovered, and can gueſs at the people, though I never heard a word of them. It is certain they all very much reſemble us, and we may know them better, whenever we will. Let them ſtay where they are. It is only going to ſee them; but we cannot get into the moon if we would, ſo that I deſpair of knowing what they do there

You will laugh at me, ſaid I, if I ſhould anſwer you ſeriously: perhaps I may deſerve it, and yet I fancy I can ſay a great deal in defence of a whim that is juſt now come into my head; nay, to uſe the fools beſt argument, I will lay a wager I will make you own, in ſpite of reaſon, that one of theſe days there may be a communication between the earth and the moon, and who knows what great advantages we may reap by it? Do but conſider America before it was diſcovered by Columbus; how profoundly ignorant were thoſe people? they knew nothing at all of arts and ſciences, they went naked, had no other arms but bows and arrows, and did not apprehend they might be carried by animals, they looked upon the ſea as a wide ſpace, not for the uſe of men, but thought it was joined to the heavens, but beyond it was nothing: it is true, after having ſpent whole years hollowing the trunks of great trees with ſharp ſtones, they put themſelves to ſea in theſe trunks, and floated from land to land, as the wind and waves drove them, but how often was their trough overſet, and they forced to recover it again by ſwimming? So that, except when they were on land, it might be ſaid they were continually ſwimming: and yet had any one but told them of another kind of navigation,

incomparably more perfect and uſeful than their own, that would eaſily convey over that infinite ſpace of water, that they might ſtop in the middle of the waves, and in ſome ſenſe command the winds, and make their ſhip ſail faſt, or ſlow, as they pleaſed; in ſhort, that this impaſſable ocean ſhould be no obſtacle to their converſing with another different people; do you think they would have believed you? And yet at laſt that day is come: the unheard of, and moſt ſurprizing, ſight appears: enormous bodies, with white wings, are ſeen to fly upon the ſea; to vomit fire from all parts; and to caſt on their ſhores, an unknown people, ſcaled over with iron; who diſpoſe and govern monſters as they pleaſe; carry thunder in their hands, and deſtroy whoever reſiſts them: from whence came they? who brought them over the ſea? who gave them the diſpoſal of the fire of heaven? Are they gods? are they the offspring of the ſun? For certainly they are not men.

Do but conſider, Madam, the ſurpriſe of the Americans; there can be nothing greater; and after this, will any one ſay there ſhall never be a communication between the moon and the earth? Did the Americans believe there would ever be any between them and Europe, till they ſaw it? It is true

you muſt paſs this great ſpace of air and heaven, which is between the earth and the moon; but did not thoſe vaſt ſeas ſeem at firſt impaſſible to the Americans? You rave, I think, ſaid ſhe. Who denies it, Madam? ſaid I. Nay, but I will prove it, replied ſhe. I do not care for your bare owning it; did you not own the Americans were ſo ignorant that they had not the leaſt conception of croſſing the ſea? but we, who know a great deal more than they, can imagine and fancy the going through the air, though we are aſſured it is not to be done. It is ſome what more than fancy, replied I, when it has been already practiſed; for ſeveral have found the ſecret of faſtening wings, which bear them up in the air, to move then as they pleaſe, and to fly over rivers, and from ſteeple to ſteeple: I cannot ſay indeed thay have yet made an eagle's flight, or that it does not coſt now and then a leg or an arm to one of theſe new birds; but this may ſerve to repreſent the firſt planks that were launched on the water, and which were the beginning of navigation; there were no veſſels then thought of to ſail round the world in, and yet you ſee what great ſhips are grown, by little and little, from thoſe rude planks. The art of flying is but newly invented; it will improve by degrees, and in time grow perfect; then we

may fly as far as the moon. We do not yet pretend to have diſcovered all things, or that what we have diſcovered can receive no addition; and therefore, pray let us agree, there are yet many things to be done in the ages to come. Were you to live a thouſand years, ſays the Marchioneſs, I can never believe you will fly, but you muſt endanger your neck. I will not, replied I, be ſo unmannerly as to contradict a fair lady; but though we cannot learn the art here, I hope you will allow, they may fly better in the moon, it is no great matter whether we go to them, or they come to us: we ſhall then be like the Americans, who knew nothing of navigation; and yet there were very good ſhips at the other end of the world. Were it ſo, ſaid ſhe, in a ſort of a paſſion, the inhabitants of the moon would have been here before now. All in good time, ſaid I; the Europeans were not in America till about 6000 years; ſo long were they in improving navigation to the point of croſſing the ocean. The people in the moon have already made ſome ſhort voyages in the air; they are exerciſing continually, and by degrees will be more expert, and when we ſee them, God knows how we ſhall be ſurpriſed. It is unſufferable, ſaid ſhe, you ſhould banter me at this rate, and juſtify your ridiculous fancy by

ſuch falſe reaſoning. I am going to demonſtrate, ſaid I, that you reproach me very unjuſtly: conſider Madam, that the world is unfolded by degrees; for the ancients were very poſitive, that both the torrid and frigid zones were not habitable, by reaſon of their exceſſive heat and cold; and in the time of the Romans, the general map of the world was but very little extended beyond that of their own empire; which, though in one reſpect, expreſſed much grandeur; in another ſenſe was a ſign of as great ignorance; however, there were men found both in very hot and in very cold countries; ſo that you ſee the world is already increaſed. After this, it was thought that the ocean covered the whole earth, except what was then diſcovered: there was no talk of the antipodes none ſo much as I thought of them; for who could fancy their heels at top, and their heads at botttom? And yet, after all their fine reaſoning, the antipodes were diſcovered: here is now another half of the world ſtarts up, and a new reformation of the map. Methinks this, Madam, ſhould reſtrain us, and teach us not to be ſo poſitive in our opinions; the world will unfold itſelf more to us hereafter; we ſhall then know the people in the moon, as well as we do now the antipodes; but all things muſt be done in order, the whole

muſt be firſt diſcovered; and till we are perfectly acquainted with our own habitation, we ſhall never know that of our neighbours. Without fooling, ſaid the Marchioneſs, looking earneſtly on me, you are ſo very profound in this point, that I begin to think you are in earneſt, and believe what you ſay. Not ſo neither, ſaid I, but I would ſhew you, Madam, how eaſy it is to maintain a chimerical notion, that may perplex a man of underſtanding, but never convince him: there is not any argument ſo perſuaſive as truth, which has no need to exert all its proofs, but enters naturally into our underſtanding; and when once we have learned it, we do nothing but think of it. I thank you then, ſaid ſhe, for impoſing on me no longer; for I confeſs your falſe reaſoning diſturbed me, but now I ſhall ſleep very quietly, if you think fit to retire for to night.

THE THIRD EVENING.

Particulars concerning the World in the Moon, and Proofs of the other Planets being habitable.

THE Marchioneſs was ſo intent upon her notions, that ſhe would fain have engaged me next day, to proceed where I left of; but I told her, ſince the moon and ſtars were become the ſubject of our diſcourſe, we ſhould truſt our chimeras with no body elſe. At night, therefore, we went again into the park, which was now wholly dedicated to our learned converſation.

Well, Madam, ſaid I, I have great news for you; that which I told you laſt night, of the moon being inhabited, may be otherwiſe now: there is a new fancy got into my head, which puts thoſe people in great danger. I cannot, ſaid her Ladyſhip, ſuffer ſuch whims to take place. Yeſterday you were preparing me to receive a viſit from the lunarians, and now you would inſinuate there are no

ſuch folks. You muſt not trifle with me thus: once you would have me believe the moon was inhabited ; I ſurmounted that difficulty, and do now believe it. You are a little too nimble, replied I; did not I adviſe you never to be intirely convinced of things of this nature, but to reſerve half of your underſtanding free and diſengaged, that you might admit of a contrary opinion, if there ſhould be occaſion ? I care not for your ſuppoſitions, ſaid ſhe, let us come to matter of fact. Are we not to conſider the moon as St Dennis ? No, ſaid I, the moon does not ſo much reſemble the earth, as St. Dennis does Paris : the ſun draws vapours from the earth, and exhalations from the water, which mounting to a certain height in the air, do there aſſemble and form the clouds ; theſe uncertain clouds are driven irregulary round the globe, ſometimes ſhadowing one country, and ſometimes another ; he, then, who beholds the earth from afar of, will ſee frequent alteration upon its ſurface, becauſe a great country, overcaſt with clouds, will appear dark or light, as the clouds ſtay, or paſs over it ; he will ſee the ſpots on the earth often change their place and appear or diſappear as the clouds remove, but we ſee none of theſe changes wrought upon the moon, which would certainly be the ſame, were there but clouds about her ; yet

on the contrary; all her ſpots are fixed and certain, and her light parts continue where they were at firſt, which indeed is a great misfortune; for by this reaſon, the ſun draws no exhalations or vapours above the moon; ſo that it appears ſhe is a body infinitely more hard and ſolid than the earth, whoſe ſubtile parts are eaſily ſeparated from the reſt, and mount upwards as ſoon as heat puts them in motion: but it muſt be a heap of rock and marble, where there is no evaporation; beſides exhalations are ſo natural and neceſſary where there is water, that there can be no water at all where there is no exhalations; and what ſort of inhabitants muſt thoſe be whoſe country affords no water, is all rock, and produces nothing? This is very fine, ſaid the Marchioneſs; you have forgot ſince you aſſured me, we might from hence diſtinguiſh ſeas in the moon. Pray, what is become of your Caſpian ſea, and your Black lake? All conjecture, Madam, replied I, though for your Ladyſhip's ſake, I am very ſorry for it; for thoſe dark places we took to be ſeas may perhaps be nothing but large cavities; it is hard to gueſs right at ſo great a diſtance. But will this ſuffice then, ſaid ſhe, to extirpate the people in the moon? Not altogether, replied I, we will neither determine for nor againſt them. I muſt own my weak-

neſs, if it be one, said ſhe, I cannot be ſo perfectly undetermined as you would have me to be, but muſt believe one way or other; therefore pray fix me quickly in my opinion, as to the inhabitants of the moon: preſerve or annihilate them, as you pleaſe, and yet methinks I have a ſtrange inclination for them, and would not have them deſtroyed, if it were poſſible to ſave them. You know, ſaid I, Madam, I can deny you nothing; the moon ſhall be no longer a deſert; but to do you ſervice we will re-people her. Since to all appearance the ſpots in the moon do not change I cannot conceive there are any clouds about her that ſometimes obſcure one part, and ſometimes another; yet this does not hinder, but that the moon ſends forth exhalations and vapours. The clouds, which we ſee in the air, are nothing but exhalations and vapours, which at their coming out of the earth were ſeparated into ſuch minute particles, that they could not be diſcerned; but as they aſcend higher, they are condenſed by the cold, and by the re-union of their parts are rendered viſible; after which they become great clouds, which fluctuate in the air, their improper region, till they return back again to us in rain; however, theſe exhalations and vapours ſometimes keep themſelves ſo diſperſed, that they are imperceptible; or if they do aſſemble, it is in forming ſuch ſubtile dews

that they cannot be diſcerned to fall from any cloud. Now, as it ſeems incredible the moon ſhould be ſuch a maſs, that all its parts are of an equal ſolidity, all at reſt one with another and all incapable of any alterations from the efficacy of the ſun; I am ſure we are yet unacquainted with ſuch a body: marble itſelf is of another nature, and even that, which is moſt ſolid, is ſubject to change and alteration, either from the ſecret and inviſible motion it has within itſelf, or from that which it receives from without: It may ſo happen, that the vapours which iſſue from the moon may not aſſemble round her in clouds, and may not fall back again in rain, but only in dews. It is ſufficient for this, that the air with which the moon is ſurrounded, for it is certain ſhe is ſo, as well as the earth, ſhould ſomewhat vary from our air, and the vapours of the moon be a little different from thoſe of the earth, which is very probable. Hereupon the matter being otherwiſe diſpoſed in the moon than on the earth, the effects muſt be different; tho' it is of no great conſequence whether they are or no; for from the moment we have found an inward motion in the parts of the moon, or one produced by foreign cauſes, here is enough for the new birth of its inhabitants, and a ſufficient and neceſſary fund for their ſubſiſtence. This will furniſh us with corn, fruit, water, and what

elſe we pleaſe; I mean according to the cuſtom or manner of the moon, which I do not pretend to know; and all proportional to the wants and uſes of the inhabitants, with whom I own I am as little acquainted.

That is to ſay, replied the Marchioneſs, you know all is very well, without knowing how it is ſo; which is a great deal of ignorance, founded upon a very little knowledge; however I comfort myſelf, that you have reſtored the moon her inhabitants again, and have enveloped her in an air of her own, without which a planet would ſeem to me but very naked.

It is theſe two different airs, Madam, that hinder the communication of the two planets; if it was only flying, as I told you yeſterday, who knows but we might improve it to perfection, though I confeſs there is but little hopes of it; the great diſtance between the moon and the earth is a difficulty not eaſily to be ſurmounted; yet were the diſtance but inconſiderable, and the two planets almoſt contiguous, it would ſtill be impoſſible to paſs from the air of the one, into the air of the other: the water is the air of fiſhes, they never paſs into the air of the birds, nor the birds into the air of the fiſh; and yet it is not the diſtance that hinders them, but both are impriſoned by the air they breathe in; we find our air conſiſts of thicker and groſſer vapours than the air of the

moon; ſo that one of her inhabitants arriving at the confines of our world, as ſoon as he enters our air, will inevitably drown himſelf, and we ſhall ſee him fall dead on the earth.

I ſhould rejoice, ſaid the Marchioneſs, to ſee a wreck of a good number of theſe lunar people; how pleaſant would it be to behold them lie ſcattered on the ground, where we might conſider at our eaſe, their extraordinary figures? But, replied I, ſuppoſe they could ſwim on the ſurface of our air, and be as curious to ſee us, as you are to ſee them; ſhould they angle, or caſt a net for us, as for ſo many fiſh, would that pleaſe you? Why not, ſaid ſhe, ſmiling? For my part, I would go into their nets of my own accord, were it but for the pleaſure of ſeeing ſuch ſtrange fiſhermen.

Conſider, Madam, you would be very ſick, when you were drawn to the top of our air, for there is no reſpiration in its whole extent as may be ſeen on the tops of ſome very high mountains: and I admire that they who have the folly to believe that fairies, whom they allow to be corporeal, and to inhabit the moſt pure and refined air; do not tell us, that the reaſon why they give us ſuch ſhort and ſeldom viſits is, that there are very few among them who can dive; and thoſe that can, if it be poſ-

ſible to get through the thick air where we are, cannot ſtay half ſo long in it, as one of your diving fowls can in the water. Here then are natural barricades, which defend the paſſage out of our world, as well as the entry into that of the moon: ſo that ſince we can only gueſs at that world, let us fancy all we can of it. For example, I will ſuppoſe that we may there ſee the firmament, the ſun, and the ſtars, of another colour than what we ſee here; all theſe appear to us through a kind of natural optics, which change and alter the objects. Theſe ſpectacles, as we may call them, are our air, mixed as it is with vapours and exhalations, and which does not extend itſelf very high. Some of our modern philoſophers pretend, that of itſelf it is blue, as well as the water of the ſea, and that this colour neither appears in the one nor in the other, but at a great depth: the firmament, ſay they, where the fixed ſtars are placed, has no peculiar light of its own, and by conſequence muſt appear black; but we ſee it through the air which is blue; and therefore to us it appears blue; which if ſo, the beams of the ſun and ſtars cannot paſs through the air without being tinged a little with its colour, and loſing as much of their own: yet, were the air of no colour, it is very certain, that thro' a great miſt, the light of a flambeau, at ſome diſtance, appears rediſh,

tho' it be not its true natural colour. Our air is nothing but a great miſt, which changes the true colour both of the ſky, ſun, and ſtars, it belongs only to the celeſtial matter to bring us the light and colours as they really are, in all their purity; ſo that ſince the air of the moon is of another nature than our air, or is diverſified by another colour, or at leaſt is another kind of miſt, which varies the colours of the celeſtial bodies; in ſhort, as to the people of the moon, their ſpectacles, through which they ſee every thing, are changed.

If it be ſo, ſaid the Marchioneſs, I prefer this abode before that of the moon; for I cannot believe the celeſtial colours are ſo well mixed as they are here; for inſtance, if you put green ſtars on a red ſky, they cannot be ſo agreeable as ſtars of gold on an azure firmament. To hear you, one would imagine, Madam, ſaid I, you were chuſing a petticoat, or a ſuit of knots: but believe me, nature does not want fancy; leave it to her to chuſe colours for the moon; and I will engage they ſhall be well ſorted; ſhe will not fail to vary the proſpect of the univeſe at every different point of ſight, and the alteration ſhall always be very agreeable.

I know very well, ſaid the Marchioneſs, her ſkill in this point; ſhe is not at the charge of changing the objects, but only the ſpectacles

and has the credit of this great variety without being at any expence; with a blue air she gives us a blue firmament, and perhaps with a red air, she gives to the inhabitants of the moon a red firmament, and yet still it is but the same firmament; nay, I am of opinion, she has placed this sort of spectacles in our imagination, through which we see all things, and which to every particular man change the objects. Alexander looked on the earth as a fit place to establish a great empire; it seeemd to Celadon a proper residence for Astrea; and it appeared to a philosopher a great planet in the heavens, covered with fools: I do not believe the sights vary more between the earth and the moon, than they do between the fancies of two different men.

This change in our imagination, said I, is very surprising; for they are still the same objects, though they appear different; when in the moon, we may see other objects we do not see here, or at least, not see all there we do see here; perhaps, in that country they know nothing of the dawn and the twilight, before the sun rises, and after the sun sets: the air which encompasses, and is elevated above us, receives the rays, so that they cannot strike on the earth; and being gross, stops some of them, and sends them to us, though indeed they were

never naturally designed us: so that the day-break and the twilight are a favour which nature bestows on us; they are lights which do not properly belong to us; and which she gives us over and above our due. But in the moon, where apparently the air is more pure, and therefore not so proper to send down the beams it receives from the sun before his rising, and after his setting, they have not that light of grace (as I may call it) which growing stronger by degrees, does more agreeably prepare them for the arrival of the sun; and which growing weaker, and diminishing by degrees, does insensibly prepare them for the sun's departure: but they are in a profound darkness, where a curtain (as it were) is drawn all on a sudden, their eyes are immediately dazzled with the whole light of the sun in all its glory and brightness; so likewise, they are on a sudden surprized with utter darkness; the night and the day have no medium between them, but they fall in a moment from one extreme to the other. The rainbow likewise is not known to the inhabitants of the moon; for if the dawn is an effect of the grossness of the air and vapours, the rainbow is formed in the clouds, from whence the rain falls; so that the most beautiful things in the world, are produced by those which have no beauty at all. Since then there are no vapours thick enough, nor no clouds of

rain about the moon, farewell dawn, adieu rainbow: what muſt lovers do for ſimilies in that country, when ſuch an inexhauſtible magazine of compariſons is taken from them?

I ſhall not much bemoan the loſs of their ſimilies and compariſons, ſaid the Marchioneſs, for I think them well enough recompenced for the loſs of our dawn and rainbow; for by the ſame reaſon they have neither thunder nor lightning, both which are formed in the clouds! how glorious are their days, the ſun continually ſhining! how pleaſant their nights, not the leaſt ſtar is hid from them; they never hear of ſtorms or tempeſts, which certainly are plain effects of the wrath of heaven. Do you think then they ſtand in need of our pity; you are deſcribing the moon, I replied, like an inchanted iſland; but do you think it ſo pleaſant to have a ſcorching ſun always over our heads, and not the leaſt cloud to moderate its heat? Though I fancy it is for this reaſon that nature hath made great cavities in the moon; we can diſcern them eaſily with our teleſcopes, for they are not mountains, but ſo many wells or vaults in the middle of a plain: and how do we know but the inhabitants of the moon, being extremely broiled by the exceſſive heat of the ſun, do retire into thoſe great wells? perhaps they live no where elſe, and it is there they build their cities; for we ſtill ſee in the ruins of old Rome,

that part of the city which was under the ground, was almoſt as large as that which was above ground. We need but take that part away, and the reſt would remain like one of theſe lunar towns; the whole people reſide in wells, and from one well to another, there are ſubterraneous paſſages for the communication of the inhabitants.

I perceive, Madam, you laugh at me; yet, if I may be ſo free with a fair lady, you deſerve it much better than I: for you believe the people in the moon muſt live upon the ſurface of their planet, becauſe we do ſo upon ours; but quite the contrary: for as we dwell upon the ſuperficies of our planet, they ſhould not dwell upon the ſuperficies of theirs: if things differ ſo much in this world, what muſt they do in another?

It is no matter, ſaid the Marchioneſs, I can never ſuffer the inhabitants of the moon to live in perpetual darkneſs. You will be more concerned for them, I replied, when I tell you, that one of the ancient philoſophers long ſince diſcovered the moon to be the abode of the bleſſed ſouls departed out of this life, and that all their happineſs conſiſted in hearing the harmony of the ſpheres, which is made by the motion of the celeſtial bodies: and the philoſopher pretending to know exactly all they do there, he tells you, that when the moon is obſcured

by the ſhadow of the earth, they no longer hear the heavenly muſic, but howl like ſo many ſouls in purgatory: ſo that the moon taking pity on them, makes all the haſte ſhe can to get into the light again. Methinks then, ſaid the lady, we ſhould now and then ſee ſome of theſe bleſſed ſouls arrive here from the moon; for certainly they are ſent to us; and between the two planets, ſome think there is a ſufficient proviſion made for the felicity of ſouls, by their tranſporation into a new world. I confeſs indeed, ſaid I, it would be very pleasant to ſee different worlds; ſuch a voyage, though but in imagination, is very delightful; but what would it be in reality; it would be much better certainly than to go to Japan, which at beſt is but crawling from one end of the globe to the other, and after all to ſee nothing but men. Well then, ſaid ſhe, let us travel over the planets as faſt as we can. What ſhould hinder us? Let us place ourſelves at all the different proſpects, and from thence conſider the univerſe. But firſt, have we any thing more to ſee in the moon? Yes Madam, ſaid I, our deſcription of that world is not quite exhauſted; you muſt remember, that the two movements which turn the moon on herſelf, and about us, being equal the one always preſents to our eyes that part of which the other muſt conſequently deprive us, and ſo ſhe always to us wears the ſame face.

we have then but one moiety of her which looks on us, and as the moon muſt be ſuppoſed not to turn on her own center, in repect to us, that moiety which ſees us always, and that which never ſees us, remains fixed in the ſame point of the firmament. When it is night with her, and her nights are equal to fifteen of our days, ſhe at firſt ſees but a little corner of the earth enlightened, after that a larger ſpot, and ſo almoſt by hourly gradations ſpreads her light, till it covers the face of the whole globe; whereas theſe ſame changes do not appear to us to effect the moon; but from one night to another: becauſe we loſe her a long time out of our ſight. I would give any thing that I could poſſibly fathom the aukward reaſonings of the philoſophers of their world upon our earth's appearing immoveable to them, when all the other celeſtial bodies riſe and ſet over their heads within the compaſs of fifteen days: It is plain they attribute this immobility to her bigneſs, for ſhe is forty times larger than the moon; and when their poets have a mind to extol indolent princes, I doubt not but they take care to compare their inactivity to this majeſtic repoſe of the earth: However, this opinion is attended with one difficulty; they muſt very ſenſibly perceive in the moon, that our earth turns upon her own center. For inſtance, ſuppoſe that Europe, Aſia, and Ameri-

ca preſent themſelves one after another to them in miniature, and in different ſhapes and figures, almoſt as we ſee them upon maps: Now this ſight muſt be a novelty to ſuch travellers, as paſs from that moiety of the moon which never ſees us, to that which always does. Ah! how curious would they be of believing the relation of the firſt travellers, who ſhould ſpeak of it after their return to that great country, to which we are ſo entirely unknown! Now I fancy, ſaid the Marchioneſs, they make a ſort of voyage from one ſide of their country to the other, to try to make diſcoveries in our world; and that there are certain honours, and privileges aſſigned to ſuch as have, once in their lives, had a view of our groſs planet. At leaſt, replied I, thoſe who have had this view obtained the privilege of being better lighted during their nights; the reſidence in the other moiety of the moon muſt of neceſſity be much leſs commodious in that reſpect. But now let us continue the journey we propoſed to take from one planet to another, for I think we have had a pretty curious ſurvey of the moon, at leaſt you have ſeen all I can ſhew you. Leaving the moon on the ſide next the ſun, we ſee Venus, which puts me again in mind of St. Dennis. Venus turns upon herſelf, and round the ſun as well as the moon; they likewiſe diſcover by their teleſcopes, that Venus like,

the moon (if I may ſpeak after the ſame manner) is ſometimes new, sometimes full, and ſometimes in the waiu, according to the different ſituations ſhe is in with reſpect to the earth.

The moon, to all appearance is inhabited; why ſhould not Venus be ſo too? You are ſo full of your why's and your wherefore's, ſaid the Marchioneſs, interrupting me, that I fancy you are ſending colonies to all the planets: You may be certain, Madam, I replied, that I will, for I ſee no reaſon to the contrary: We find that all the planets are of the ſame nature, all obſcure bodies, which receive no light but from the ſun, and then ſend it to one another: their motions are the ſame, ſo that hitherto they are alike; and yet, if we are to believe that theſe vaſt bodies are not inhabited, I think they were made to little purpoſe: Why ſhould nature be ſo partial as to except only the earth? But let who will ſay the contrary, I muſt believe the planets are peopled as well as the earth. I find, ſaid the Marchioneſs with ſome concern, a philoſopher will never make a good martyr, you can ſo quickly ſhift your opinion! It was not many minutes ſince the moon was a perfect deſart; now I ſee you would be very angry, if any one ſhould ſay all the reſt of the planets are not inhabited. Why truly, Madam, ſaid I, there is a time for all things; and your true philoſopher believes any thing,

or nothing, as the maggot bites. And this is not ſo very improbable as you think it: For I cannot help thinking it would be very ſtrange, that the earth ſhould be ſo very well peopled, and the other planets not inhabited at all; for do you believe we diſcover (as I may ſay) all the inhabitants of the earth? There are as many kinds of inviſible, as viſible creatures; we ſee from the elephant to the very piſmire, beyond which our ſight fails us, and yet counting from that minute creature, there are an infinity of leſſer animals, which would be imperceptible, without the aid of glaſſes. We ſee with magnifying glaſſes that the leaſt drop of rain-water, vinegar, and all other liquids, are full of little fiſhes or ſerpents, which we could never have ſuſpected there; and philoſophers believe that the acid taſte of theſe liquids proceeds from a ſharpneſs iſſued through the forked ſtings of theſe animals lodged under their tongues. And therefore, by mixing certain things with any one of theſe liquors, and expoſing them in the ſun, or letting them ſtand and corrupt, will produce a new ſpecies of little animals.

Some even of the moſt ſolid bodies are nothing but an immenſe ſwarm of imperceptible inſects, who find for their reſpective motions as much room and liberty as they require. A mulberry-leaf is a little world, inhabited

by multitudes of theſe inviſible worms, which to them, is a country of vaſt extent. What mountains, what abyſſes are there in it? the inſects on one ſide of this leaf know no more of their fellow creatures on the other, than you and I can tell what they are now doing at the antidopes: does it not appear therefore, more reaſonable, that a great planet ſhould be inhabited? in the hardeſt ſtones, for example, in marble, there are an infinity of worms, which fill up the vacuums, and feed upon the ſubſtance of the ſtone; fancy then millions of living creatures to ſubſiſt many years on a grain of ſand; ſo that were the moon but one continued rock, I would ſooner allow her to be gnawed by theſe inviſible mites, than not to be inhabited: in ſhort, every thing is animated; imagine then thoſe animals which are yet undiſcovered, and add them and theſe which are but lately diſcovered, to what we have always ſeen, and you will find the earth ſwarm with inhabitants, and that nature has ſo liberally furniſhed it with animals, that ſhe is not at all concerned for our not ſeeing above one half of them: why then ſhould nature, which is fruitful to an exceſs here, be ſo very ſterile in the reſt of the planets, as to produce no living things in them? I muſt own, ſaid the Marchioneſs, you have convinced my reaſon, but you have

confounded my fancy with ſuch variety, that I cannot imagine how nature, which abhors repetition, ſhould produce ſo many different kinds. There is no need of fancy, Madam, do but truſt your eyes, and you will eaſily perceive how nature diverſifies in theſe ſeveral worlds.

All human faces, in general, are of the ſame model; and yet the Europeans and the Africans have two particular moulds, nay commonly every family has a different aſpect; what ſecret then has nature to ſhew ſo much variety in the ſingle face? Our world, in reſpect of the univerſe, is but a little family, wherein every face has ſome reſemblance to each other; in another planet, is another family, whoſe faces have a different air and make: the difference too increaſes with the diſtance; for whoſoever ſhould ſee an inhabitant of the moon, and an inhabitant of the earth, would ſoon perceive they were nearer neighbours than one of the earth, and one of Saturn: here, for example, we have the uſe of voice; in another world, they ſpeak by ſigns; and at a greater diſtance they do not ſpeak at all: here our reaſon is formed by experience; in the next world, experience contributes but little towards reaſon; and in the next to that, old men know no more than children: here we are troubled more with what

is to come, than with what is past; in the new world they are more troubled for what is past, than what is to come; and farther off, they are not concerned with either, which, by the bye, I think, is much the better. Here, it is thought we want a sixth sense, that would teach us many things, of which we are now ignorant; this sixth sense is apparently in the other world, where they want one of the five which we enjoy; nay, perhaps there is a much greater number of senses, but in the partition we have more of them with the inhabitants of the other planets there are but five fallen to our share, with which we are all well contented, for want of being acquainted with the rest: our sciences have bounds, which the wit of man could never pass; there is a point where they fail us on a sudden, the rest is reserved for other worlds, where somewhat which we know, is unknown to them. This planet enjoys the pleasures of love, but lies desolate in several places by the furys of war; in another planet they enjoy perpetual peace, yet in the midst of that peace, know not any thing of love, and time lies on their hands: in a word, that which nature practises here in little, in distributing her gifts among mankind, she does at large in other worlds, where she makes use of that admirable secret she has to diversify all things, and at the

same time makes them equal, by compensating for the inequality.

But is it not time, Madam, how to be serious? how will you dispose of all these notions? Trouble not yourself, said she; fancy is a great traveller; I already comprehend all these worlds, and form to myself their different characters and customs; some of them, I assure you, are very extraordinary; I see, at this moment, a thousand various figures, though I cannot well describe them. O leave them, said I, to your dreams; we shall know to morrow whether they represent the matter faithfully, and what they have taught you, in relation to the inhabitants of any of the planets.

FOURTH EVENING.

Particulars of the Worlds of Venus, Mercury, Mars, Jupiter, and Saturn.

THE dreams of the Marchioneſs were not very ſucceſsful; they ſtill repreſented to her the ſame objects we are acquainted with here on earth; and I had room to approach her ladyſhip, as thoſe people do us at the ſight of our regular pictures, who themſelves make only wild and grotesque paintings. Well, ſay they, this is only an imitation of men; there is no manner of fancy in it. We were therefore forced to conclude ourſelves ignorant what ſort of inhabitants all theſe planets had, and content ourſelves only to gueſs at them, and continue the voyage we had begun through theſe ſeveral worlds.

We were come to Venus, and I told her that planet certainly turned on itſelf, though no body could tell in what time, and conſequently were ignorant how long her day laſted; but her year was compoſed of eight

months, becauſe it is in that time ſhe turns round the ſun; and ſeeing Venus is forty times leſs than the earth, the earth appears to them in Venus, to be a planet forty times bigger then Venus appears to us on the earth, and as the moon is forty times ſmaller than the earth, ſo ſhe ſeems to be juſt of the ſame magnitude to the inhabitants of Venus, as Venus ſeems here to us.

I ſee then, ſaid the lady, that the earth is not to Venus, what Venus is to the earth; I mean, that the earth is too big to be the mother of love, or the ſhepherd's ſtar to Venus; but the moon, which appears to Venus of the ſame bigneſs which Venus appears to us, is aſſigned to be the mother of love and ſhepherd's ſtar to Venus; for ſuch names are only proper for a little briſk airy planet, bright, and ſhining, as the goddeſs herſelf. O, bleſſed moon, how happy art thou to preſide over the amours of thoſe inhabitants of Venus, who muſt be ſuch maſters of gallantry! O, doubtleſs, ſaid I, the very common people of Venus are all Celadons and Sylvanders, and their moſt trivial diſcourſes are infinitely finer than any in Clelia. Their very climate inſpires love: Venus is much nearer than the earth is to the ſun, from whence ſhe receives a more vigorous and active influence.

I find, said the Marchioness, it is easy enough to guess at the inhabitants of Venus; they resemble what I have read of Moors of Granada, who were a little black people, scorched with the sun, witty, full of fire, very amorous, much inclined to music, and poetry, and ever inventing masks and tournaments in honour of their mistresses. Pardon me, Madam, said I, you are little acquainted with this planet: Granada in all its glory was a perfect Greenland to it; and your gallant Moors, in comparison with that people, were as stupid as so many Laplanders.

But what do you think then of the inhabitants of Mercury? They are yet nearer to the sun, and are so full of fire, that they are absolutely mad: I fancy they have not any memory at all, no more than most of the negroes; that they make no reflections, and what they do is by sudden starts, and perfect hap-hazard: in short, Mercury is the bedlam of the universe; the sun appears to them much greater than it does to us, because they are much nearer to it than we; it sends them so vast and strong a light, that the most glorious day here would be no more with them than a declining twilight. I know not, whether they can distinguish objects; but the heat, to which they are accustomed, is so excessive, that they would be starved with cold

in the Torrid Zone: their year is but three months, and we know not the exact length of their day, becauſe Mercury is ſo little, and ſo near the ſun, it is, as it were, loſt in his rays, and is hardly discovered by the aſtronomers; ſo that they cannot obſerve how it moves on its center; but becauſe it is ſo ſmall, they fancy it completes its motion in a little time; ſo that by conſequence, the day there is very ſhort, and the ſun appears to them like a vaſt fiery furnace, at a little diſtance, whoſe motion is prodigiouſly ſwift and rapid: this is ſo much the better for them, ſince it is evident they muſt long for night; and during their night, Venus and the earth, which muſt appear conſiderably large, give light to them; as for the other planets which are beyond the earth towards the firmament, they appear leſs to the inhabitants of Mercury, than they do to us here, and they receive but little light from them, perhaps none at all; the fixed ſtars likewiſe ſeem to them leſs, and ſome of them totally diſappear, which, were I there, I ſhould eſteem a very great loſs. I ſhould be very uneaſy to ſee this large convex ſtudded with but few ſtars, and thoſe too of the leaſt magnitude and luſtre.

What ſignifies the loſs of a few fixed ſtars? ſaid the lady; I pity them for the exceſſive

heat they endure; let us give them ſome relief, and ſend Mercury a few of thoſe refreſhing ſhowers, which continue ſometimes four months together, in the hotteſt countries, during their greateſt extremity. Your fancy is good, Madam, replied I, but we will relieve them another way: In China there are countries which are extremly hot by their ſituation; yet, in July and Auguſt are ſo cold, that the rivers are frozen; the reaſon is, they are full of ſaltpetre, which being exhaled in great abundance, by the exceſſive heat of the ſun, makes a perfect winter at midſummer. We will fill the little planet with saltpetre, and let the ſun ſhine as hot as he pleaſes. And yet after all, who knows but the inhabitants of Mercury may have no occaſion either for rain, or ſaltpetre? If it is a certain truth, that nature never gives life to any creature but where that creature may live: then, through cuſtom, and ignorance of a better life, thoſe people may live happily.

After Mercury, comes the ſun; but there is no poſſibility of peopling it, nor any room left for a wherefore. By the earth, which is inhabited, we judge that other bodies of the ſame nature may likewiſe be inhabited: but the ſun is a body not like the earth, or any of the planets; the ſun is the ſource or foun-

tain of light, which, though it is ſent from one planet to another, and receives ſeveral alterations by the way, yet all originally proceeds from the ſun: he draws from himſelf that precious ſubſtance which he emits from all ſides, and which reflects when it meets with a ſolid body, and ſpreads from one planet to another thoſe long and vaſt trains of light which croſs, ſtrike through, and intermingle in a thouſand different faſhions, and make, if I may ſo ſay, the richeſt tiſſues in the world. The ſun likewiſe is placed in the center, from whence, with moſt convenience, he may equally diſtribute and animate by his heat; it is then a particular body, but what kind of body, has often puzzled better heads than mine. It was thought formerly a body of pure fire, and that opinion paſſed current till the beginning of this age; when they perceived ſeveral ſpots on its ſurface. A little after they had diſcovered new planets, as we ſhall preſently hear of, theſe, ſome ſaid, were the ſpots; for thoſe planets moving round the ſun, when they turned their dark half to us, muſt neceſſarily hide part of it; and had not the learned with theſe pretended planets made their court before to moſt of the princes in Europe, giving the name of this prince to one, and of that prince to another planet, I believe they would have quarrelled who ſhould

be maſter of theſe ſpots, that they might have named them as they pleaſed.

I cannot approve that notion; it was but the other day, ſaid ſhe, you were deſcribing the moon, and called ſeveral places by the names of the moſt famous aſtronomers. I was pleaſed with the fancy; for ſince the princes have ſeized on the earth, it is fit the philoſophers, who are as proud as the beſt of them, ſhould reſerve the heavens for themſelves, without any competitors. O, anſwered I, trouble not yourſelf; the philoſophers make the beſt advantage of their territories, and if they part with the leaſt ſtar, it is upon very good terms; but the ſpots on the ſun are falling to nothing: it is now diſcovered that they are not planets, but clouds, ſtreams or droſs, which riſe upon the ſun, ſometimes in a great quantity, ſometimes in a leſs, ſometimes they are dark, ſometimes clear, ſometimes they continue a great while, and ſometimes they diſappear as long. It ſeems the ſun is a liquid matter, ſome think of melted gold, which ſeems to boil over continually, and by the force of its motion, caſts the ſcum or droſs on its ſurface, where it is conſumed, and others riſe. Imagine then what ſtrange bodies theſe are, when ſome of them are as big as the earth: what a vaſt quantity muſt there be of this melted gold, and what muſt

be the extent of this great ſea of light and fire, which they call the ſun? Others ſay, the ſun appears through their teleſcopes, full of mountains, which vomit fire continually, and are joined together like millions of Etnas. Yet there are thoſe who ſay theſe burning mountains are pure viſion, cauſed by a fault in the optics; but what ſhall we credit, if we muſt diſtruſt our teleſcopes, to which we owe the knowledge of ſo many new objects? But let the ſun be what it will, it cannot be at all proper for habitation; and what pity that is, for how pleaſant would it be? You might then be at the center of the univerſe, where you would ſee all the planets turn regularly about you; but now we are only poſſeſſed with extravagant fancies, becauſe we do not ſtand in the proper place; there is but one place in the world where the ſtudy or knowledge of the ſtars is eaſily obtained, and what pity it is there is no body there. You forget yourſelf, ſure, ſaid ſhe; were you in the ſun you would ſee nothing, neither planets nor fixed ſtars; does not the ſun efface all? So that could there be any inhabitants there, they might juſtly think themſelves the only people in nature.

I own my miſtake, Madam; I was thinking of the ſituation of the ſun, and not of the effect of its light. I thank you for your cor-

rection; but muſt take the freedom to tell you, that you are in an error, as well as myſelf; for were there inhabitants in the ſun, they would not ſee at all; either they could not bear the ſtrength of its light, or for want of a due diſtance, they could not receive it; ſo that things well conſidered, all the people there muſt be ſtone-blind, which is another reaſon why the ſun cannot be inhabited: but let us purſue our voyage. We are now arrived at the center, which is always the bottom, or loweſt place of what is round; if we go on, we muſt aſcend; then we ſhall find Mercury, Venus, the earth, the moon, all the planets we have already viſited: the next is Mars, who affords nothing curious that I know of; his day is not quite an hour longer than ours, but his year is twice as long; he is a little leſs than the earth, and the ſun ſeems not altogether ſo large and ſo bright to him, as it appears to us: but let us leave Mars, he is not worthy our ſtay: But what a pretty thing is Jupiter, with his four moons or yeoman of the guard? they are four little planets which turn round him; as our moon turns round us. But why, ſaid the Marchioneſs, interrupting me, muſt there be planets to turn round other planets, that are no better than themſelves? I ſhould think it would be more regular and uniform, that all the

planets, ſmall and great, without any diſtinc-
tion, ſhould have one and the ſame motion
round the ſun.

Ah, Madam, ſaid I, if you did but know
what Des Cartes's whirlpools or vortexes
were, whoſe name is terrible, but their idea
pleaſant, you would not be of that opinion.
Why, ſaid ſhe, ſmiling, muſt my head turn
round to comprehend them, or muſt I be-
come a natural fool to underſtand the myſte-
ries of philoſophy! Well, let the world ſay
what it will, go on with your whirlpools. I
will, ſaid I, and you ſhall ſee the whirlpools
are worthy of theſe tranſports: that then
which we call a whirlpool, or vortex, is a
maſs of matter, whoſe parts are ſeparated,
or detached from one another, yet have all
one uniform motion: and at the ſame time,
every one is allowed, or has a particular mo-
tion of it own, provided it follows the ge-
neral motion: thus a vortex of wind, or
whirlwind, is an infinity of little particles of
air, which turn round all together, and in-
volve whatever they meet with. You know
the planets are born up by the celeſtial mat-
ter, which is very ſubtile and active; ſo that
this great maſs, or ocean, of celeſtial matter,
which flows as far as from the ſun to the fix-
ed ſtars, turns round, and bears the planets
along with it, making them all turn after the
ſame manner round the ſun, who poſſeſſes

the center; but in a longer, or a ſhorter time, according as they are farther or nearer in diſtance to it: there is not any planet next the ſun, which does not turn, but he turns on himſelf, becauſe he is juſt in the middle of this celeſtial matter; and you muſt know by the way, that were the earth in his place, it muſt turn on itſelf, as the ſun does. This is the great vortex, of which the ſun is lord: yet at the ſame time, the planets make little peculiar vortexes, in imitation of that of the ſun; each of them in turning round the ſun does at the ſame time turn round itſelf, and makes a certain quantity of celeſtial matter turn round it likewiſe, which is always prepared to follow the motion, which the planet gives it, provided it is not diverted from its general motion; this then is the particular vortex of the planet, which puſhes it as far as the ſtrength of its motion reaches; and if by chance, a leſſer planet falls into the vortex of a greater planet, it is immediately born away by the greater, and is indiſpenſibly orced to turn round, though at the ſame time, the great planet, the little planet, and the vortex which encloſes them, all turn round the ſun: It was thus at the beginning of the world, when we made the moon follow us, becauſe ſhe was within the reach of our vortex, and therefore wholly at

our diſpoſal! Jupiter was ſtronger, or more fortunate than we, he had four little planets in his neighbourhood, and he brought them all four under his ſubjection; and no doubt, we, though a principal planet, had had the ſame fate, had we been within the ſphere of his activity; he is ninety times bigger than the earth, and would certainly have ſwallowed us into his vortex! we had then been no more than a moon in his family: but now we have one to wait on us; ſo that you ſee the advantage of ſituation often decides all our good fortune.

But pray, ſaid ſhe, who can aſſure us we ſhall continue as we do now? If we ſhould be ſuch fools as to go near Jupiter, or be ſo ambitious as to approach us, what will become of us? For if, as you ſay, the celeſtial matter is continually under this great motion, it muſt needs agitate the planets irregularly; ſometimes drive them together, and ſometimes ſeparate them. Luck is all, ſaid I; we may win as well as loſe; and who knows, but we might bring Mercury and Venus under our government? they are little planets, and cannot reſiſt us; but in this particular, Madam, we need neither hope nor fear; for the planets keep within their own bounds, and are obliged, as the kings of China were formerly, not to undertake new con-

queſts. Have you not ſeen when you put water and oil together, the oil ſwims a-top; and if to theſe two liquors you add a very little more, the oil bears it up, and it will not ſink to the water, put an heavier liquor, of a juſt weight, and it will paſs through the oil, which is too weak to ſuſtain it, and ſink till it comes to the water, which is ſtrong enough to bear it up; ſo that in this liquid, compoſed of two liquors, which do not mingle, two bodies of an equal weight will naturally aſſume two different places; the one will never aſcend, the other will never deſcend; if we put ſtill other liquors, which do not mingle, and throw other bodies on them, it will be the ſame thing: fancy then that the celeſtial matter, which fills this great vortex, has ſeveral reſting places, one by another, whoſe weight are different like that of oil, water, and other liquors; the planets too are of a different weight, and conſequently every planet ſettles in that place which has a juſt ſtrength to ſuſtain and keep it equilibrate; ſo, you ſee, it is impoſſible it ſhould ever go beyond.

I very well apprehend, ſaid the Marchioneſs, that theſe weights keep their ſtations regularly. Would to God our world were as well regulated, and every one among us knew their proper place. I am not now in any fear of being over-run by Jupiter, and ſince he

lets us alone in our vortex, with our moon, I do not envy him the four which he has. Did you envy him, replied I, you would do him wrong, for he has no more than what he has occaſion for; at the diſtance he is from the ſun, his moons receive and ſend him but a very weak light; it is true, that as he turns upon himſelf in ten hours, his nights, by conſequence, are but five hours long; ſo one would think there is no great occaſion for four moons, but there are other things to be conſidered. Here, under the poles, they have ſix months day, and ſix months night, becauſe the poles are the two extremities of the earth, the fartheſt removed from thoſe places where the ſun is over them in a perpendicular line. The moon ſeems to keep almoſt the ſame courſe as the ſun, and if the inhabitants of the pole ſee the ſun during one half of his courſe in the year, and during the other half, do not ſee him at all; they ſee the moon likewiſe during one half of her courſe of a month; that is, ſhe appears to them fifteen days, but they do not ſee her during the other half. Jupiter's year is as much as twelve of ours, ſo that there muſt be two oppoſite extremities in that planet, where their night and their day are ſix years each. A night ſix years long is a little diſconſolate, and it is for that reaſon, I ſuppoſe they have four moons; that which in

regard to Jupiter, is uppermoſt, finiſhes its courſe about him in ſeventeen days, the ſecond in ſeven, the third in three days and an half, and the fourth in forty two hours; and though they are ſo unfortunate as to have ſix years night, yet their courſe being exactly divided into halves, they never paſs above twenty one hours, wherein they do not ſee at leaſt the laſt moon, which is a great comfort in ſo tedious a darkneſs; ſo that be where you will, theſe four moons are ſometimes the prettieſt ſight imaginable; ſometimes they riſe all four together, and then ſeparate according to the inequality of their courſe; ſometimes they are all in their meridian, ranged one above another; ſometimes you ſee them at equal diſtances on the horizon; ſometimes when two riſe, the other two go down. O, how I ſhould like to ſee their perpetual ſport of eclipſes; for there is not a day paſſes, but they eclipſe the ſun, or one another; and they are ſo accuſtomed to theſe eclipſes in that planet that they are certainly the objects of diverſion, and not of fear, as with us.

Well, ſaid the Marchioneſs, I hope you will people theſe four moons, though you ſay they are but little ſecondary planets, appointed to give light to another planet during its night. Do not doubt it, replied I; theſe planets are not a jot the worſe to be inhabited,

for being forced to turn round another planet of greater consequence. I would have then said she, the people of these four moons to be so many colonies under Jupiter's government; they should, if it were possible, receive their laws and customs from him, and consequently pay him a kind of homage, and not view his great planet without paying a deference. Would it not be convenient too, said I, that they should send deputies with addresses to him, to assure him of their fidelity? for he has certainly a more absolute command over his moon, than we have over ours; though his power, after all, is but imaginary, and consists chiefly in making them afraid; for that moon, which is nearest to him, sees that he is 360 times bigger than our moon appears to us; for in truth, he is so much bigger than she; he is also much nearer to them, than our moon is to us; which makes him appear three greater; so that this formidable planet hangs continually over their heads, at a very little distance; and if the Gauls were afraid heretofore, that the heavens would fall on them, I think, the inhabitants of that moon may well be apprehensive that Jupiter will at some time or other overwhelm them. I fancy, said the Lady, they are possessed with that fear, because they or not concerned at eclipses: every one has their peculiar folly; we are a-

fraid of an eclipſe, and they, that Jupiter will fall on their heads. It is very true, ſaid I, the inventor of the third ſyſtem I told you of the other night, the famous Tycho-Brache, one of the greateſt aſtronomers that ever lived, did not apprehend the leaſt danger from an eclipſe, when every body elſe was under the greateſt conſternation: but what apprehenſions do you think he entertained inſtead of them? This great man was ſo unaccountably ſuperſtitious, that if an hare did but croſs him, or an old woman bolt upon him at his first coming out, he inſtantly looked upon his journey to be ominous, ſhut himſelf up for that day, and would not be concerned in the leaſt buſineſs. It would be very unreaſonable, replied ſhe, after ſuch a man could not redeem himſelf from the fear of eclipſes, without falling into ſome ſome other whimſy as troubleſome, that the inhabitants of that moon of Jupiter, whereof we were talking, ſhould come off upon eaſier terms: but we will give them no quarter; they ſhall come under the general rule, and if they are free from one error, ſhall fall into another, to put them upon an equivalent: but as I do not trouble myſelf, becauſe I cannot gueſs what the next error may be, pray clear up one more difficulty to me, which has given me ſome pain for ſeveral minutes. Tell me, if the

earth be so little in comparison of Jupiter, whether his inhabitants do discover us? Indeed, I believe not, said I; for if we appear to him ninety times less than he appears to us, judge you if there be any possibility: yet this we may reasonably conjecture, that there are astronomers in Jupiter, who after they have made the most curious telescopes, and taken the clearest night for their observations, may have discovered a little planet in the heavens, which they never saw before; if they publish their discovery, most people know not what they mean, or laugh at them for fools; nay, the philosophers themselves will not believe them, for fear of destroying their own opinions; yet some few may be a little curious, they continue their observations, discover the little planet again, and are now assured it is no vision; then they conclude it has a motion round the sun, and after a thousand observations, find that it completes this motion in a year; and at last, thanks to the learned! they know in Jupiter that our earth is a world; every body runs to see it at the end of a telescope, though it appears so small, as to be scarcely discernible.

It must be pleasant, said she, to see the astronomers of both planets, levelling their tubes at one another, and mutually asking, What world is that? What people inhabit it?

Not ſo faſt neither, replied I, for though they may from Jupiter diſcover our earth; yet they may not know us; that is, they do not in the leaſt ſuſpect it is inhabited; and ſhould any one there chance to have ſuch a fancy, he might be ſufficiently ridiculed, if not proſecuted for it; for my part, I believe they have work enough to make diſcoveries on their own planet, not to trouble their heads with ours. It is ſo large, that if they have any ſuch thing as navigation, their Chriſtopher Columbus could never want employment; why, I warrant you, they have not yet diſcovered the hundredth part of their planet. But if Mercury is ſo ſmall, they are all, as it were, near neighbours, and it is but taking a turn to go round that planet. But if we do not appear to them in Jupiter, they cannot certainly diſcover Venus and Mercury, which are much leſs than the earth, and at a greater diſtance; but in lieu of it, they ſee Mars, their own four moons, and Saturn with his; this I think is work enough for their aſtronomers; and nature has been ſo kind to conceal from them the reſt of the univerſe.

Do you think it a favour then, ſaid ſhe? Yes certainly, replied I, for there are ſixteen planets in this great vortex: nature ſaves us the trouble of ſtudying the motions of them all, and ſhows us but ſeven, which I think is very

obliging, though we know not how to value the kindneſs, for we have recovered the other nine which were hid from us, and ſo render the ſcience of aſtronomy much more difficult than nature deſigned it.

If there are ſixteen planets, ſaid the Marchioneſs, Saturn muſt have five moons. It is very true, replied I, and two of theſe five are but lately diſcovered; but there is ſomewhat that is more remarkable; ſince his year makes thirty of ours, and there are conſequently in him ſome countries, where their night is fifteen years long; what can you imagine nature has invented to give light, during a night ſo dreadful? Why, ſhe has not only given Saturn five moons, but ſhe has encompaſſed him round with a great circle or ring; this being placed beyond the reach of the ſhadow, which the body of that planet caſts, reflects the light of the ſun continually on thoſe places where they cannot ſee the ſun at all.

I proteſt, ſaid the Marchioneſs, this is very ſurpriſing, and yet all is contrived in ſuch great order, that it is impoſſible not to think but nature took time to conſider the neceſſities of all animate beings, and that the diſpoſing of theſe moons was not a work of chance; for they are only divided among thoſe planets which are fartheſt diſtant from the ſun, the

earth, Jupiter, and Saturn; indeed it was not worth while to give any to Mercury or Venus, they have too much light already, and they account their nights, as ſhort as they are, a greater bleſſing than their day. But pray, why has not Mars a moon too? It ſeems he has none, though he is much farther than the earth from the ſun. It is very true, ſaid I; no doubt but he has other helps, though we do not know them: you have ſeen the phoſphorus, both liquid and dry, how it receives and imbibes the rays of the ſun, and what a great light it will caſt in a dark place: perhaps Mars has many great high rocks, which are ſo many natural phoſphoruſes, which in the day time take in a certain proviſion of light, and return it again at night. What think you, Madam, is it not very pleaſant, when the ſun is down, to ſee theſe lighted rocks, like ſo many glorious illuminations, made without any art, and which can do no manner of hurt by their heat? beſides, there is a ſpecies of birds in America, which reflect ſuch a light, that, you may read by it in the darkeſt night, and who knows but Mars may have great flocks of theſe birds, that as ſoon as it is night diſperſe themſelves into all parts, and ſpread from their wings a new day?

I am not at all contented, ſaid ſhe, either with your rocks, or your birds; it is a pretty

fancy indeed, but it is a ſign that there ſhould be moons in Mars, ſince nature has given ſo many to Saturn and Jupiter; and if all the other worlds that are diſtant from the ſun have moons, why ſhould Mars only be excepted? Ah, Madam, ſaid I, when you are a little more dipped in philoſophy, you will find exceptions in the very beſt ſyſtems; there are always ſome things that agree extremely well; but then there are others which do not accord at all, thoſe you muſt leave as you found them, if ever you intend to make an end: we will do ſo by Mars, if you pleaſe, and ſay no more of him, but return to Saturn. What do you think of this great ring, in the form of a ſemicircle, that reaches from one end of the horizon to the other, which reflecting the light of the ſun, performs the office of a continual moon? And muſt we not inhabit this ring too, ſaid ſhe, ſmiling? I confeſs ſaid I, in the humour I am in, I could almoſt ſend colonies every where; and yet I cannot well plant any there, it ſeems ſo irregular a habitation; but for the five little moons, they cannot chuſe but be inhabited; though ſome think this ring is a circle of moons which follow cloſe to one another, and have an equal motion; and that the five little moons fell out of this circle; how many worlds are there in the vortex of Saturn? But let it be

how it will, the people in Saturn live very miſerably: it is true, this ring gives light to them, but it muſt be a very poor one, when the ſun ſeems to them but a little pale ſtar, whoſe light and heat cannot but be very weak at ſo great a diſtance. They ſay Greenland is a perfect bagnio, in compariſon of this planet, and that they would expire with heat in our coldeſt countries.

You give me, ſaid ſhe, ſuch an idea of Saturn, as makes me ſhake with cold, and that of Mercury puts me into a fever. It cannot be otherwiſe, replied I, for the two worlds, which are the extremities of this great vortex, muſt be oppoſite in all things. They muſt then, ſaid ſhe, be very wiſe in Saturn, for you told me they were all fools in Mercury. If they are not wiſe, ſaid I, yet they have all the appearances of being very phlegmatic: they are people that know not what it is to laugh, they take a day's time to anſwer the leaſt queſtion you can aſk them; and are ſo very grave, that were Cato living among them, they would think him a Merry Andrew.

It is very odd to conſider, ſaid ſhe, that the inhabitants of Mercury are all life, and the inhabitants of Saturn quite contrary; but among us, ſome are briſk, and ſome are dull; it is, I ſuppoſe, becauſe our earth is placed in the middle of the other worlds, and ſo we

participate of both extremes, there is no fixed or determinate character; some are made like the inhabitants of Mercury, others like those of Saturn; we are a mixture of the several kinds which are found in the rest of the planets. Why, said I, do not you approve of the idea? Methinks it is pleasant to be composed of such a fantastical assembly, that one would think we were collected out of different worlds; we need not travel abroad; when we see the other worlds in epitome at home.

I am sure, said the Marchioness, we have one great convenience in the situation of our world; it is not so hot as Mercury and Venus, nor so cold as Jupiter or Saturn; and our country is so temperately placed, that we have no excess either of heat or cold. I have heard of a philosopher, who gave thanks to nature that he was born a man, and not a beast, a Greek, and not a Barbarian; and for my part, I render thanks that I am seated in the mildest planet of the universe, and in one of the most temperate regions of that planet. You have more reason, said I, to give thanks that you are young, and not old; that you are young and handsome, not young and homely; that you are young, handsome, and a French Woman, and not young, handsome, and an Italian, these are more proper subjects

for your thanks, than the ſituation of your vortex, or the temperature of your country.

Pray, Sir, ſaid ſhe, let me give thanks for all things, to the very vortex in which I am planted: our proportion of happineſs is ſo very ſmall, that we ſhould not loſe any, but improve continually what we have, and be grateful for every thing, though ever ſo common or inconſiderable. If nothing but exquiſite pleaſure will ſerve us, we muſt wait a long time, and be ſure to pay too dear for it at laſt. I wiſh, ſaid I, that philoſophy was the pleaſure you propoſe, that when you think of vortexes, you would not forget an humble ſervant of your ladyſhip's. I eſteem it a pleaſure, anſwered the lady, while it diverts me with ſomething new, but no longer. I will engage for it till to-morrow, replied I, for the fixed ſtars are ſuperior to whatever you have yet ſeen.

FIFTH EVENING.

Shewing that the fixed stars are so many suns, every one of which gives light to a World.

THE Marchioness was very impatient to know what would become of the fixed stars; are they peopled, said she, as the planets are, or are they not inhabited at all; or in short, what shall we do with them? You may soon guess, said I, the fixed stars cannot be less distant from the earth than fifty millions of leagues; nay, if you anger an astronomer, he will set them farther. The distance from the sun to the farthest planet, is nothing in comparison of the distance from the sun, or from the earth to the fixed stars; it is almost beyond arithmetic. You see their light is bright and shining, and did they receive it from the sun, it must needs be very weak, after a passage of fifty millions of leagues; then judge how much it is wasted by reflection; for it comes back again as far to us; so that forwards and backwards, here are an hundred millions of leagues for it to pass, and it is im-

poſſible it ſhould be ſo clear and ſtrong as the light of a fixed ſtar, which cannot but proceed from itſelf; ſo that in a word, all the fixed ſtars are luminous bodies in themſelves, and ſo many ſuns.

I perceive, ſaid the Marchioneſs, where you would carry me; you are going to tell me, that if the fixed ſtars are ſo many ſuns, and our ſun the center of a vortex which turns round him, why may not every fixed ſtar be the center of a vortex that turns round the fixed ſtar? Our ſun enlightens the planets; why may not every fixed ſtar have planets to which they give light? You have ſaid it, replied I, and I will not contradict you.

But you have made the univerſe ſo large, ſaid ſhe, that I know not where I am, or what will become of me: what, is it all to be divided into vortexes confuſedly, one among another! Is every ſtar the center of a vortex, as big as ours! Is that vaſt ſpace which comprehends our ſun and planets, but an inconſiderable part of the univerſe! And are there as many ſuch ſpaces, as there are fixed ſtars! I proteſt it is dreadful, the very idea of it confounds and overwhelms me. Dreadful! Madam, ſaid I, I think it very pleaſant: when the heavens were a little blue arch, ſtuck with ſtars, methought the univerſe was too ſtrait and cloſe, I was almoſt ſtifled for want

of air; but now it is enlarged in height and breadth, and a thouſand and a thouſand vortexes taken in; I begin to breathe with more freedom, and think the univerſe to be incomparably more magnificent than it was before. Nature has ſpared no coſt, even to profuſeneſs, and nothing can be ſo glorious, as to ſee ſuch a prodigious number of vortexes, whoſe ſeveral centers are poſſeſſed by a particular ſun, which makes the very planets turn round it. The inhabitants of a planet of one of theſe innumerable vortexes behold on all ſides theſe luminous centers of the vortex, with which they are encompaſſed; but perhaps they do not ſee the planets, who, receiving but a faint light from the ſun, cannot ſend it beyond their own world.

You preſent me with a proſpect of ſo vaſt a length, that no eye can reach to the end of it: I plainly ſee the inhabitants of the earth, and you have made me diſcover thoſe who dwell in the moon, and in other planets of our vortex; theſe inhabitants indeed I can conceive pretty plainly, but I do not ſee them ſo clearly as thoſe of the earth: after theſe, we come to the inhabitants of the planets which are in the other vortexes, but they are ſunk into ſo great a depth, that though I do all I can to ſee them, yet I muſt confeſs I can hardly perceive them; by the expreſſion you make uſe

of in mentioning them, they ſeem to be almoſt annihilated; you ought then to call them the inhabitants of one of thoſe innumerable vortexes; we ourſelves, for whom the ſame expreſſion ſerves, muſt confeſs that we ſcarce know where we are, in the midſt of ſo many worlds; for my own part, I begin to ſee the earth ſo minutely ſmall, that I believe from henceforward, I ſhall never be concerned at all for any thing; that we ſo eagerly deſire to make ourſelves great, that we are always deſigning, always troubling and haraſſing ourſelves, is certainly becauſe we are ignorant what theſe vortexes are; but now I hope my new lights will in part juſtify my lazineſs, and when any one reproaches me with my indolence, I will anſwer, ah, did you but know what the fixed ſtars are! It was not fit, ſaid I, that Alexander ſhould know what they were; for a certain author*, who maintains that the moon is inhabited, very gravely tells us, that Ariſtotle, from whom no truth could be long concealed, muſt neceſſarily be of an opinion, backed with ſo much reaſon; but yet he never durſt acquaint Alexander with the ſecret, leſt he ſhould run mad with deſpair, when he knew there was another world which he could not conquer: with much more reaſon then was this myſtery of vortexes

* Huygens.

and fixed ſtars kept ſecret in Alexander's time; for though they had been known in thoſe days, yet it had been but an ill way of making one's court, to have ſaid any thing of them to that ambitious prince; for my part, I that know them, am not a little troubled to find myſelf not a jot the wiſer for all the knowledge I have of them; the moſt they can do, according to your way of reaſoning, is but to cure people of their ambition, and their unquiet reſtleſs humour, which are diſeaſes I am not at all troubled with; I confeſs I am guilty of ſo much weakneſs, as to be in love with what is beautiful; that is my diſtemper, and I am confident the vortexes can never cure it: what if the other worlds render ours ſo very little? They cannot ſpoil fine eyes, or a pretty mouth, their value is ſtill the ſame, in ſpite of all the worlds that can poſſibly exiſt.

This love, replied the Marchioneſs, ſmiling, is a ſtrange thing; let the world go how it will, it is never in danger, there is no ſyſtem can do it any harm. But, tell me freely, is your ſyſtem true? Pray do not conceal any thing from me; I will keep your ſecret very faithfully; it ſeems to have for its foundation but a ſlight probability, which is, that if a fixed ſtar be in itſelf a luminous body, like the ſun, then by conſequence, it muſt, as the ſun is, be the center and ſoul of a world; and have

its planets turning round about it: but is there an abſolute neceſſity it muſt be ſo? Hear me, Madam, ſaid I; ſince we are in the humour of mingling light gallantries with a ſerious diſcourſe, I muſt tell you, that in love and the mathematics, people reaſon much alike: allow ever ſo little to a lover, yet preſently after you muſt grant him more; nay, more and more; which will at laſt go a great way: in like manner, grant but a mathematician one minute principle, he immediately draws a conſequence from it, to which you muſt neceſſarily aſſent; and from this conſequence another, till he leads you ſo far, whether you will or no, that you have much ado to believe him. Theſe two ſorts of people, lovers and mathematicians, will always take more than you give them. You grant, that when two things are like one another in all viſible reſpects, it is poſſible they may be like one another in thoſe reſpects which are not viſible, if you have not ſome good reaſon to believe otherwiſe: Now this way of arguing have I made uſe of. The moon, ſaid I, is inhabited, becauſe ſhe is like the earth; and the other planets are inhabited, becauſe they are like the moon; I find the fixed ſtars to be like our ſun, therefore I attribute to them what is proper to him: you are now going too far to be able to retreat, therefore you muſt go for-

ward with a good grace. But, ſaid the lady, if you build upon this reſemblance, or likeneſs, which is between our ſun, and the fixed ſtars, then, to the people of another great vortex, our ſun muſt appear no bigger than a ſmall fixed ſtar, and can be ſeen only when it is night with them. Without doubt, Madam, ſaid I, it muſt be ſo: our ſun is much nearer to us, than the ſuns of other vortexes, and therefore its light makes a much greater impreſſion on our eyes than theirs do: we ſee nothing but the light of our own ſun; and when we ſee him, it darkens and hinders us from ſeeing any other light; but in another great vortex, there is another ſun which rules and governs; and, in his turn, extinguiſhes the light of our ſun, which is never ſeen there but in the night, with the reſt of the other ſuns; that is, the fixed ſtars; with them our ſun is faſtened to the great arched roof of heaven, where it makes a part of ſome bear or bull: for the planets which turn round about it, our earth for example, as they are not ſeen at ſo vaſt a diſtance, ſo no body will ſo much as dream of them: all the ſuns then are day ſuns in their own vortexes, but night ſuns in other vortexes: in his own world or ſphere, every ſun is ſingle, and there is but one to be ſeen; but every where elſe, they ſerve only to make a

number. May not these worlds, replied she, notwithstanding this great resemblance between, differ in a thousand other things? for though they may be somewhat alike in one particular, they may greatly differ in others.

It is certainly true, said I; but the difficulty is to know wherein they differ. One vortex has many planets that turn round about its sun; another vortex has but a few: in one vortex there are inferior or less planets, which turn about those that are greater; in another, perhaps there are no inferior planets; here, all the planets are got round about their sun, in form of a little squadron; beyond which is a large void space, which reaches to the neighbouring vortexes: in another place, the planets take their course towards the outside of their vortex, and leave the middle void. There may be vortexes also quite void, without any planets at all; others may have their sun not exactly in their center; and that sun may so move, as to carry its planets along with it; some may have planets, which in regard of their sun, ascend, and descend, according to the change of their equilibration, which keeps them suspended. In short, what variety can you wish for? But, I think, I have said enough for a man that was never out of his own vortex.

It is not so much, replied the Marchioness,

conſidering what a multitude of worlds there are; what you have ſaid is ſufficient for five or ſix, and from hence I ſee thouſands.

What would you ſay, Madam, if I ſhould tell you, there are many more fixed ſtars than thoſe you ſee? And that an infinite number are diſcovered with glaſſes, which are not perceptible to the naked eye, and that in one ſingle conſtellation, where perhaps we count twelve or fifteen, there are as many more to be found as uſually appear in the whole hemiſphere.

I ſubmit, ſaid ſhe, and beg your pardon: you quite confound me with worlds and vortexes. Oh, Madam, I have a great deal more to tell you, replied I; you ſee that whiteneſs in the ſky, which ſome call the milky way; can you imagine what that is? Why, it is nothing but an infinity of ſmall ſtars, not to be ſeen by our eyes, becauſe they are ſo very little, and they are ſown ſo thick, one by another, that they ſeem to be one continued whiteneſs: I wiſh you had a glaſs, to ſee this ant-hill of ſtars, and this cluſter of worlds, if I may ſo call them; they are in ſome ſort like the Maldivy-iſlands: thoſe twelve thouſand banks of ſand, ſeparated only by narrow channels of the ſea, which a man may as eaſily leap over as a ditch: ſo near together are the vortexes of the milky way, that I preſume

the people in one world may talk, and ſhake hands, with thoſe of another; at leaſt, I believe the birds of one world may eaſily fly into the other; and that pigeons may be trained up to carry letters, as they do in the Levant. Theſe little worlds are excepted out of that general rule, by which one ſun in his own vortex as ſoon as he appears, effaces the light of all other foreign ſuns: if you were in one of theſe little vortexes of the milky way, your ſun would not be much nearer to you, and conſequently, would not make any more ſenſible impreſſion on your eyes, than a hundred thouſand other ſuns of the neighbouring vortexes: you would then ſee your heaven ſhine bright with an infinite number of fires, cloſe to one another, and but a little diſtant from you; ſo that though you ſhould loſe the light of your own particular ſun, yet there would ſtill remain viſible ſuns ſufficient beſide your own, to make your nights as light as day; at leaſt, the difference would hardly be perceived; for the truth is, you would never have any light at all: the inhabitants of theſe worlds, accuſtomed to perpetual brightneſs, would be ſtrangely aſtoniſhed, if they ſhould be told that there are a miſerable ſort of people, who, where they live, have very dark nights, and when it is day with them, they never ſee more than one

ſun; certainly they would think nature had very little kindneſs for us, and would tremble with horror, to think what a ſad condition we are in.

I do not aſk you, ſaid the Marchioneſs, whether in thoſe worlds of the milky way, there are any moons; I ſee they would be of no uſe to thoſe principal planets which have no night, and move in ſpaces too ſtrait and narrow to cumber themſelves with the baggage of inferior planets: yet pray take notice, that by your liberal multiplication of worlds, you have ſtarted an objection not eaſily anſwered: the vortexes, whoſe ſuns we ſee, touch the vortex in which we are; and if it be true, that vortexes are round, how then can ſo many bowls, or globes, all touch a ſingle one? I would fain know how this may be done, but cannot reconcile it to myſelf.

Madam, ſaid I, you ſhew a great deal of wit, in raiſing this doubt, and likewiſe in not being able to reſolve it; for in itſelf, the thing ſeems extremely difficult; and, as you ſtate the queſtion, no anſwer can be given to it; and he muſt be a fool, who goes about to find anſwers to objections which are unanſwerable. If our vortex had the form of a dye, it would have ſix ſquares, or flat ſurfaces, and would be far from being round; and upon every one of

these squares, might be placed a vortex of the same figure; but if instead of these six squares it had twenty, fifty, or 1000; then might 1000 vortexes be placed upon it, one upon every flat; and, you know very well, that the more flat faces any body has on its outside, the nearer it approaches to roundness, just as a diamond cut facewise on every side, if the faces be very many and little, it will look as round as a pearl of the same bigness: It is in this manner that the vortexes are round; they have an infinite number of faces on their outside, and every one of them has upon it another vortex; these faces are not all equal and alike; but here, some are greater, and there, some less: the least faces of our vortex, for example, answer to the milky-way, and sustain all those little worlds. When two vortexes are supported by the two next flats on which they stand, if they leave beneath any void spaces between them, as it must often happen, nature, who is an excellent housewife, and will not suffer any thing to be useless, presently fills up this void space with a small vortex or two, perhaps with 1000, which never incommode the others, and become one, two or 1000 worlds more; so that there may be many more worlds than our vortex has flat surfaces to bear them. I will lay a good wager, that though these little worlds were made

only to be thrown into the corners of the universe, which otherwise would have been void and useless; and though they are unknown to other worlds which they touch, yet they are well satisfied with being what they are: these are the little worlds, whose suns are not to be discovered but with a telescope, and whose number is prodigious: to conclude, all these vortexes are joined to one another in so admirable a manner, that every one turns round about his own sun, without changing place; every one has such a turn as is most easy and agreeable to its own situation: they take hold of one another, like the wheels of a watch, and mutually help each other's motion: and yet it is certain that they act contrary to one another. Every world, as some say, is like a foot-ball, made of a bladder, covered with leather, which sometimes swells of its own accord, and would extend itself, if it were not prevented. But this swelling world, being pressed by the next to it, returns to its first figure; then swells again, and is again depressed; and some affirm, that the reason why the fixed stars gives a twinkling and trembling light, and sometimes seem not to shine at all, is because their vortexes perpetually push and press our vortex, and ours again continually repulses theirs.

I am in love with these fancies, said Ma-

dam, and pleaſed with the foot-balls, which ſwell every moment, and ſink again; and with theſe worlds, which are continually ſtriving and puſhing one another; but above all, I am pleaſed to ſee how this juſtling keeps up the trade of light, which is certainly the only correſpondence that is between them.

No, no, Madam, ſaid I; light is not their ſole commerce; the neighbouring worlds ſometimes pay viſits to us, and that in a very magnificent and ſplendid manner: comets arrive from thence, adorned with bright ſhining hair, venerable beards, and majeſtic tails. Theſe, ſaid the Marchioneſs, are ambaſſadors, whoſe viſits may be well ſpared, ſince they ſerve only to fright us. They terrify only children, ſaid I, with their extraordinary train; but, indeed, the number of ſuch children is now a-days very great. Comets are nothing but planets which belong to a neighbouring vortex, they move towards the outſide of it; but perhaps this vortex being differently preſſed by theſe vortexes which encompaſs it above, is rounder than below, and the lower part is ſtill towards us. Theſe planets, which have begun to move in a circle above, are not aware, that below their vortex will fail them, becauſe it is, as it were, broken. Therefore to continue the circular motion, it is neceſsary that they enter into another vor-

tex, which we will ſuppoſe is ours, and that they cut through the outſides of it. They appear to us very high, and are much higher than Saturn; and according to our ſyſtem, it is abſolutely neceſſary they ſhould be ſo high for reaſons that do not ſignify any thing to our preſent ſubject. From Saturn downwards to the other ſide of our vortex, there is a large void ſpace without any planets. Our adverſaries often aſk us, to what purpoſe this void ſpace ſerves? But let them not trouble themſelves any more, I have found a uſe for it. It is the apartment of thoſe ſtrange planets, which come into our world.

I underſtand you, ſaid ſhe, we do not ſuffer them to come into the heart of our vortex, among our own planets, but we receive them as the Grand Seignior does the ambaſſadors who are ſent to him; he will not ſhew them ſo much reſpect as to let them reſide within the walls of Conſtantinople, but conſigns them one of the ſuburbs of the city. Madam, ſaid I, we, and the Ottomans, agree likewiſe in this, that as they receive ambaſſadors, but never ſend any, ſo we never ſend any of our planets into the worlds that are next us.

By this, ſaid ſhe, it appears that we are very proud? however, I do not yet very well know what I am to believe. Theſe foreign

planets, with their tails and their beards, have a terrible countenance; it may be they are ſent to affront us; but ours, that are of another make, if they ſhould get into other worlds, are not ſo proper to make people afraid.

Neither their beards, nor tails, Madam, ſaid I, are real; only phenomena, mere appearances. Theſe foreign planets differ in nothing from ours: but entering into our vortex, they ſeem to us to have tails or beards, by a certain ſort of illumination which they receive from the ſun, and which has not been yet well explained. But it is certain, that is but a kind of illumination, and when I am able, I will tell you how it is done. I wiſh, then, ſaid ſhe, that our Saturn would go take a tail and a beard in another vortex, and fright all the inhabitants of it. Then I would have him come back again, leaving his terrible accoutrements behind him, and, taking his uſual place amongſt our other planets, fall to his ordinary buſineſs. It is better for him, ſaid I, not to go out of our vortex. I have told you how rude and violent the ſhock is, when two vortexes juſtle one another, a poor planet muſt needs be terribly ſhaken, and its inhabitants in no better condition. We think ourſelves very unhappy when a comet appears, but it is the comet which is in an ill caſe. I do not believe that, ſaid ſhe, it

brings all its inhabitants with it in very good health; there can be nothing so diverting as to change vortexes. We, that never go out of our own sphere, lead but a dull life; if the inhabitants of a comet had but the wit to foresee the time when they are to come into our world, they, who had already made the voyage, could tell their neighbours before-hand what they would see, and could inform them, that they would discover a planet with a great ring about it, meaning our Saturn; they would also say, you shall see another planet which has four little ones to wait on it, and perhaps some of them, resolving to observe the very moment of their entrance into our world, would presently cry out, a new sun, a new sun, as sailors use to cry, land, land.

You have no reason then, said I, to pity the inhabitants of a comet, yet I suppose you will think their condition lamentable, who inhabit a vortex whose sun comes in time to be quite extinguished, and consequently who live in eternal night. How, cried the Marchioness, can suns be extinguished? Yes, without doubt, said I, for people, some thousand years ago, saw fixed stars in the sky which are now no more to be seen; these were suns which have lost their light, and certainly there must be a strange desolation in their

vortexes, and a general mortality over all the planets; for what can people do without a ſun? This is a diſmal fancy, ſaid the lady, I would not, if I could help it, let it come into my head. I will tell you, if you pleaſe, replied I, what is the opinion of learned aſtronomers as to this particular: They think that the fixed ſtars, which have diſappeared, are not quite extinguiſhed, but that they are half-ſuns, that is, they have one half dark, and the other half light, and turning round upon their own axis or center, they ſometimes ſhew us their light ſide, and afterwards turning to us their dark one, we ſee them no more. To oblige you, Madam, I will be of this opinion, becauſe it is not ſo harſh as the other, though I cannot make it good but in relation to ſome certain ſtars, becauſe, as Huygens has lately obſerved, thoſe ſtars have their regulated times of appearing, and diſappearing, otherwiſe there could be no ſuch thing as half-ſuns. But what ſhall we ſay of ſtars which totally diſappear, and never ſhew themſelves again after they have finiſhed their courſe of turning round upon their own axis? You are too juſt, Madam, to oblige me to believe that ſtars are half-ſuns. However, I will try once more what I can do in favour of your opinion: the ſuns are not extinct, they are only ſunk ſo low into the immenſe

depth of heaven, that we cannot poſſibly ſee them; in this caſe, the vortex follows his ſun, and all is well again. It is true, that the greateſt part of the fixed ſtars have not this motion, by which they remove themſelves ſo far from us, becauſe at other times they might return again nearer to us, and we ſhould ſee them ſometimes bigger, and ſometimes leſs, which never happens. But we will ſuppoſe that none but the little, light, and moſt active vortexes, which ſlip between the others, make certain voyages, after which they return again, while the main body of vortexes remain unmoved. It is likewiſe very ſtrange that ſome fixed ſtars ſhew themſelves to us, and take up a great deal of time in appearing and diſappearing, and at laſt, totally and entirely diſappear. Half-ſuns would appear again at their fixed and regulated time. But ſuns, which ſhould be ſunk low into the depths of heaven, would diſappear but once, and not appear again for a vaſt ſpace of time. Now, Madam, declare your opinion boldly: muſt not theſe ſtars, of neceſſity, be ſuns, which are ſo much darkened, as not to be viſible to us, yet afterwards ſhine again, and at laſt are wholly extinct? How can a ſun, ſaid the Marchioneſs, be darkened and quite extinguiſhed, when it is in its own nature a fountain of light? It may be done, Madam, ſaid

I, with all the eaſe in the world, if Des Cartes's opinion be true, that our ſun has ſpots; now whether theſe ſpots be ſcum, or thick miſts, or what you pleaſe, they may thicken and unite, till at laſt they cover the ſun with a cruſt, which daily grows thicker, and then farewell ſun. We have hitherto escaped pretty well; but it is reported, that the ſun for ſome whole years together has looked very pale; for example, the year after Cæſar's death; it was this cruſt that then began to grow, but the force of the ſun broke through, and it was diſſipated; had it continued, we had been all a loſt people. You make me tremble, replied Madam; and now I know the fatal conſequences of the ſun's paleneſs: I believe, inſtead of going every morning to the glaſs, to ſee how I look myſelf, I ſhall caſt my eyes up to heaven, to ſee whether or no the ſun looks pale. O! Madam, ſaid I, there is a great deal of time required to ruin a world. I grant it, ſaid ſhe, yet it is but time that is required. I confeſs it, Madam; all this immenſe maſs of matter, which compoſes the univerſe, is in perpetual motion, no part of it excepted; and ſince every part is moved, you may be ſure that changes muſt happen ſooner or latter; but ſtill in times proportioned to the effect. The ancients were merry gentlemen, to imagine, that the celeſ-

tial bodies were in their own nature unchange-
able, becauſe they obſerved no alteration in
them; but they did not live long enough to
confirm their opinion by their own experience;
they were boys in compariſon of us. Give me
leave, Madam, to explain myſelf by an alle-
gory: if roſes, which endure only a day, could
write hiſtories, and leave memoirs one to an-
other, and if the firſt roſe ſhould draw an ex-
act picture of his gardener, and after 15,000
roſe-ages, it ſhould be left to other roſes, and
ſo on ſtill to thoſe that ſhould ſucceed, with-
out any change in it; ſhould the roſes here-
upon ſay, We have ſeen every day the ſame
gardener, and in the memory of roſes, none
ever ſaw any gardener but this; he is ſtill the
ſame he was, and therefore certainly he will
not die, as we do, for there is no change at all
in him. Would not theſe roſes, Madam, talk
very fooliſhly? and yet there would be more
reaſon in their diſcourſe, than there was in
what the ancients ſaid concerning celeſtial bo-
dies: and though even to this very day there
ſhould appear no viſible change in the hea-
vens, and the matter of which they are made
ſhould have all the ſigns of an eternal dura-
tion, without any change; yet I would not
believe them unchangeable, till I had the ex-
perience of many more ages. Ought we,
whoſe lives are but a ſpan long, to make our

continuance the menſurative duration of any other being? It is not ſo eaſy a matter to be eternal: to have laſted many ages of men, one after another, is no ſign of immortality. Truly, ſaid the Marchioneſs, I find theſe worlds are far from being able to pretend to it; I will not do them ſo much honour as to compare them to the gardener, who lived ſo much longer than the roſes, I begin to think them like the roſes themſelves, which blow one day, and die the next: for now I underſtand, that if old ſtars diſappear, new ones will come in their room, becauſe every ſpecies muſt preſerve itſelf. No ſpecies, Madam, ſaid I, can totally periſh; ſome perhaps will tell you that ſuch new ſtars are ſuns, which return to our ſight again, after they have been a long time hid from us, in the profoundity of heaven: others may tell you they are ſuns cleared from that thick cruſt, which once covered them: if I ſhould think all this poſſible; yet I likewiſe believe that the univerſe may be framed in ſuch a manner that from time to time it may produce new ſuns; why may not that matter which is proper to make a ſun, be diſperſed here and there, and gather itſelf again at long run, into one certain place, and lay the foundation of a new world? I am very much inclined to believe

ſuch new productions, becauſe they ſuit with that glorious and admirable idea which I have of the works of nature. Can we think that all-wiſe nature knows no more than the ſecret of making herbs and plants live and die by a continual revolution? I am verily perſuaded, and are not you ſo too, Madam, that nature, without much coſt or pains, can put the ſame ſecret in practice upon the worlds? I now find, ſaid ſhe, the worlds, the heavens, and celeſtial bodies ſo ſubject to change, that I am come to myſelf again. To recover ourſelves the better, replied I, let us ſay no more of theſe matters. We are arrived at the very roof and top of all the heavens; and to tell you whether there be any ſtars beyond it, you muſt have a more able aſtronomer than I am; you may place worlds there, or no worlds, as you pleaſe: it is the philoſopher's empire to deſcribe thoſe vaſt inviſible countries, which are, and are not, or are ſuch as he pleaſes to make them; it is enough for me to have carried your mind as far as you can ſee with your eyes.

Well now, ſaid the Marchioneſs, I have the whole ſyſtem of the univerſe in my head; how learned am I become! Indeed, Madam, ſaid I, you are pretty knowing, and with this advantage, either of believing, or disbe-

lieving, any thing I have ſaid; all the recompence I deſire for the pains I have taken, is, that you would never look upon the ſun, the heavens, or the ſtars, without thinking on me.

SIXTH EVENING.

New observations confirming the proceeding ones. And some farther discoveries made in the HEAVENS.

It is so long, since the Marchioness of G*** and I, had any discourse concerning the planetary worlds, that we began to question whether we had ever had any on that subject. When I went one day to visit her, I came in just as two very polite gentlemen had taken their leaves of her. Well, said Madam, the very moment she perceived me, you see who hath honoured me with a visit; and, I protest, it has given me some room to suspect that it has been in your power to impose upon my judgement. I should be very proud, replied I, if I could flatter myself with such a power, because I look upon it to be the hardest task any one could attempt. As hard as it is, said she, I am afraid you have done it. I do not know how it came about, but our conversation turned upon the plurality of worlds, with my two friends who are just gone: I am not certain but they might introduce the dis-

courſe with a malicious deſign. I made no ſcruple to tell them directly, that all the planets were inhabited; one of them replied, he was very well ſatisfied I did not believe a word of it; and I, with all the ſimplicity imaginable, maintained, that it was my real opinion: he ſtill looked upon it as a piece of diſſimulation, deſigned to divert the company; and I thought, what made him ſo poſitive that I did not believe my own ſentiments, was, that he had too high an opinion of me to conceive that I could entertain ſo extravagant a notion. As for the other gentleman, who had not altogether that eſteem for me, he took me at my word. For God's ſake, why did you put a thing in my head, which people that value me cannot think I maintain ſeriously? Nay, Madam, said I, but why ſhould you attempt to maintain any ſerious poſition among a ſet of people, who, I am ſure, never entered into a way of reaſoning which had the leaſt caſt of ſeriousneſs? We ſhould not affront the inhabitants of the planets ſo highly; but content ourſelves with being a little ſelect number of advocates for them, and not communicate our myſteries to the vulgar. How, ſaid the Marchioneſs, do you call my two laſt viſitants the vulgar? They may have wit enough, ſaid I, but they never reaſon at all. And your reaſoners, who are a ſevere

ſet of people, will not make any difficulty of ſorting them with the vulgar. On the other ſide, theſe men of fire revenge themſelves by ridiculing the reaſoners; and think it is a very juſt principle in nature, that every ſpecies deſpiſes what it wants. It were right, if it was poſſible, to conform ourſelves to every ſpecies; and it had been much better for you to have railed on the inhabitants of the planets with your two friends, becauſe they are better at raillery than reaſoning, which they never make uſe of: you had then come of with their joint eſteem; and the planete had not loſt a ſingle inhabitant by it. Would you have had me ſacrifice the truth to a jeſt? ſaid ſhe; and is that all the conſcience you have? I own, anſwered I, that I have no great zeal for theſe kinds of truths, and I will ſacrifice them with all my ſoul to the leaſt conveniency of company. For inſtance, I ſee what is, and always will be, the reaſon, why the opinion of the planets being inhabited, is not thought ſo probable as it really is: the planets always preſent themſelves to our view as bodies which emit light; and not at all like great plains and meadows. We ſhould readily agree that plains and meadows were inhabited; but for luminous bodies to be ſo too, there is no ground to believe it. Reaſon may come and tell us over and over, that

there are plains and meadows in these planets, but reason comes a day too late; one glance of our eyes has had its effect before her. We will not hear a word she says; the planets must be luminous bodies, and what sort of inhabitants should they have, our imagination of course would presently represent their figures to us. It is what she cannot do, and the shortest way is to believe there are no such beings. Would you have me, for the establishment of these planetary people, whose interests are far from touching me, go to attack these formidable powers, called sense and imagination? It is an enterprise would require a good stock of courage, and we cannot easily prevail on men to substitute their reason in the place of their eyes. I sometimes meet with reasonable people enow, who are willing, after a thousand demonstrations, to believe that the planets are so many earths: but their belief is not such as it would be, if they had not seen them under a different appearance; they still remember the first idea they entertained, and they cannot well recover themselves from it. It is these kind of people, who, in believing our opinion, seem to do it a courtesy, and only favour it for the sake of a certain pleasure which its singularity gives them.

Well, said the Marchioness, interrupting

me, and is not thus ſufficient for an opinion which is but barely probable? You would be very much ſurpriſed, ſaid I, if I ſhould tell you, probable is a very modeſt term. It is ſimply probable that there ever was ſuch a man as Alexander the great? You hold it very certain that there was, and upon what is this certainty founded? Becauſe you have all the proofs which you could deſire in a like manner; and there does not the leaſt ſubject for doubt preſent itſelf to ſuſpend or arreſt your determination: for you never could ſee this Alexander, and you have not one mathematical demonſtration that there ever was ſuch a man. Now what would you ſay if the inhabitants of the planets were almoſt in the very ſame caſe? We cannot pretend to make you ſee them, and you cannot inſiſt upon the demonſtration here, as you would in a mathematical queſtion, but you have all the proofs you could deſire in our world. The entire reſemblance of the planets with the earth which is inhabited, the impoſſibility of conceiving any other uſe for which they were created, the fecundity and magnificence of nature, the certain regards ſhe ſeems to have had to the neceſſities of their inhabitants, as in giving moons to thoſe planets remote from the ſun, and more moons ſtill to thoſe yet more remote; and what is ſtill very material, there are all things to be

laid on one ſide, and nothing on the other; and you cannot comprehend the leaſt ſubject for a doubt, unleſs you will take the eyes and underſtanding of the vulgar. In ſhort, ſuppoſing that theſe inhabitants of the planets really exiſt, they could not declare themſelves by more marks, or marks more ſenſible; and after this you are to conſider, whether you are willing not to take their caſe to be more than purely probable. But you would not have me, ſaid ſhe, look upon this to be as certain as that there was ſuch a man as Alexander? Not altogether, Madam, ſaid I; for though we have as many proofs touching the inhabitants of the planets, as we can have, in the ſituation we are, yet the number of theſe proofs is not great. I muſt renounce theſe planetary inhabitants, ſaid her ladyſhip, interrupting me; for I cannot conceive how to rank them in my imagination; there is no abſolute certainty of them, and yet there is more than a probability; ſo that I am confounded in my notions. Ah, Madam, ſaid I, never put yourſelf out of conceit with them for that; the moſt common and ordinary clocks ſhow the hours, but thoſe are wrought with more art and nicety which ſhew the minutes. Juſt ſo your ordinary capacities are ſenſible of the difference betwixt a ſimple probability, and an evident certain-

tty; but it is only your fine spirits that discern the exact proportions of certainty or probability; and can mark, if I may use the phrase, the minutes in their sentiments. Now place the inhabitants of the planets a little below Alexander; yet above many other historical facts which are not so clearly proved: I believe this position will do. I love order, said she, and you oblige me in thus ranging my ideas for me: but pray, why did not you take this care before? Because, said I, should you believe the inhabitants of the planets either a little more or less than they deserve, there will be no great damage in it. I am sure that you do not believe the motion of the earth so fully it as ought to be believed; and have you much reason to complain on that score? Oh! for that matter, replied she, I have discharged myself very well, you have nothing to reproach me with on that account, for I firmly believe that the earth turns. And yet, said I, Madam, I have not given you the strongest reasons in proving it. Ah! traitor, she cried, to make me believe things upon feeble proofs: then you did not think me worthy of believing upon substantial reasons? I only proved things, said I, upon little plausible reasons, and such as were adapted to your peculiar use: should I have conjured up as strong and solid arguments, as if

I had been to attack a doctor in the ſcience? Yes, ſaid ſhe, pray take me for a doctor from this moment, and let me have your full demonſtrations of the earth's moving.

With all my heart, ſaid I, Madam, and I own the proof pleaſes me ſtrangely, perhaps becauſe I think it was of my own finding; yet it is ſo good and natural, that I muſt not preſume poſitively to have been the inventor of it: it is moſt certain, that if a learned man was puzzled, and deſired to make replications to it, he would be obliged to declaim at large, which is the only method in the world to confound a learned man. We muſt grant that all the celeſtial bodies, in twenty-four hours, turn round the earth, or that the earth turning on itſelf, imparts this motion to all the celeſtial bodies. But that they really have this revolution in twenty-four hours round the earth, is a matter which has the leaſt probability in the world, though the abſurdity does not preſently appear to our view. All the planets certainly make their great revolution about the ſun; but theſe revolutions of theirs are unequal, according to the diſtances of the reſpective planets from the ſun; for the moſt remote ones make their courſe in a longer time, which is moſt agreeable to nature: the ſame order is obſerved among the little ſecondary planets in turning about a

great one. The four moons of Jupiter, and the five of Saturn, make their circles in more or leſs time round their great planet, according as they are more or leſs remote. Beſides, it is certain that the planets have motions upon their own centers, and theſe motions likewiſe are unequal; we cannot well tell how to account for this inequality, whether it proceeds from the different magnitudes of the planets, or the different ſwiftneſs of the particular vortexes which incloſe them, and the liquid matters in which they are ſuſtained; but, in ſhort, the inequality is moſt undoubted; and ſuch is the order of nature in general, that whatever is common to many things, is found at the ſame time to vary in ſome different particulars.

I underſtand you, ſaid the Marchioneſs, interrupting me, and I think, there is a great deal of reaſon in what you ſay. I am entirely of your mind; if the planets turned about the earth, they would do it in unequal ſpaces of time, according to their diſtances, as they do about the ſun: is not that the meaning of what you were ſaying? Exactly, Madam, ſaid I, their unequal diſtances, with reſpect to the earth, their different magnitudes, and the different rapidity of the particular vortexes incloſing them, ſhould conſequently produce differences in their pretended motion

round the earth, as well as in all their other motions. And the fixed ſtars, which are at ſuch a prodigious diſtance from us, and ſo much elevated above every thing that can take a general motion round us, at leaſt, which are ſituated in a place whence this motion ſhould be very much weakened, would there not be a very great probability that they did not turn at all about us in twenty-four hours, as the moon does, who is ſo near us? And ſhould not comets, which are ſtrangers in our vortex, and which run courſes ſo different one from the other, and with ſuch unequal rapidity be excuſed from turning round us in the ſame ſpace of twenty-four hours? But no matter, fixed ſtars, and comets, and all, muſt turn round the earth in twenty-four hours; yet, if there were ſome minutes difference in theſe motions, we might be contented; and they all muſt make them with the moſt exact equality, or rather the only exact equality which is in the world, and not one minute more or leſs allowed. In reality, this matter is ſtrangely to be ſuſpected.

O, ſaid the lady, ſince it is poſſible that this grand equality ſhould be only in our imagination, I am entirely convinced it is derived only from thence. I am very well pleaſed, that any poſition, which is againſt the genius of nature, ſhould fall entirely upon

ourſelves: and that ſhe ſhould ſtand diſcharged, though at our expence. For my part, ſaid I, I am ſuch a foe to a perfect equality, that I cannot even allow all the turns, which the earth every day makes on herſelf, ſhould be preciſely in twenty-four hours, and always equal one to another; I ſhould be very much inclined to think that there are variations. Variations! cried the lady, why, do not our pendulums mark an entire equality? O, ſaid I, to your pendulums I muſt object; for they cannot be altogether juſt; and ſometimes when they are, in ſhewing us that one circuit of twenty-four hours is longer or ſhorter than another, we ſhould rather be inclined to believe them irregular, than to ſuſpect the earth of any irregularity in her revolutions. What a complaiſant reſpect is this we have for her! I would no more depend on the earth, than on a pendulum; and the very ſame caſualties almoſt, which will diſorder the one, will make the other irregular: Only, I believe, there muſt be more time allowed for the earth, than a pendulum, to be viſibly put out of order; and that is all the advantage we can give on her ſide. But might not ſhe by degrees draw nearer to the ſun? And there finding herſelf in a ſituation, where the matter is more agitated, and the motion more rapid, ſhe will in leſs time make

her double revolution both about the ſun and herſelf; ſo conſequently her years and days will be much ſhortened, but not to be perceived, becauſe we muſt ſtill go on to divide the year into 365 days, and the days into twenty four hours: ſo that without living longer than we now do, we ſhall live more years; and on the other hand, as the earth withdraws from the ſun, we ſhall live fewer years than we do now, and yet have our lives of the ſame extent. There is a great deal of probability, ſaid ſhe, that whenever it falls out thus, long ſucceſſions of ages will make but very little variation. I agree with you, Madam, replied I, the conduct of nature is very nice, and ſhe has a method of bringing about all things by degrees, which are not ſenſible, but in very obvious and eaſy changes: we are ſcarce able to perceive the change of the ſeaſons, and for ſome others which are made with a certain deliberation they do not fail to eſcape our obſervance. However all is in a perpetual rotation, and not ſo much as the lady's face in the moon, which was diſcovered with teleſcopes, within theſe forty years, but what is grown conſiderably old. She had a good tolerable countenance, but now her cheeks are ſunk, her noſe grown long, and her chin and forehead meet, ſo

that all graces are varniſhed, and age has made her a terrible ſpectacle.

What a ſtory do you tell, ſaid the lady, interrupting me! It is no impoſition, Madam, replied I, they have perceived in the moon a particular figure, which had the air of a woman's head jutting out of rocks, and it is owing to ſome change that have happened there. Some pieces of mountains have mouldered away, and left us to diſcover three points, which can only ſerve to make up the forehead, noſe, and chin, of an old woman. Well, ſaid ſhe, but do not you think it is ſome deſtiny that had a particular ſpite to beauty? And very juſtly it was this female-head, which ſhe would attack above all the moon. Perhaps in recompence, replied I, the changes, which happen upon our earth, dreſs out ſome face, which the people in the moon ſee; I mean ſomething like what we conceive a face in the moon; for every one beſtows on objects thoſe ideas of which they themſelves are full. Our aſtronomers ſee, on the ſurface of the moon, the faces of women and may be, if the ladies were to make their ſpeculations, they would diſcern the phyſiognomy of fine men. For my part, Madam, I do not know whether I ſhould not fancy your ladyſhip's charms there. I proteſt, ſaid ſhe, I cannot help being obliged

to any one who ſhould find me there. But to come back to what you are mentioning juſt now: do any conſiderable changes affect the earth? In all appearance they do, replied I: old fables tell us, that Hercules ſplit aſunder with his hands the two mountains, called Calpe and Abila, which ſtand betwixt Africa and Spain, ſtopped the ocean from flowing there, and that immediately the ſea ruſhed with violence over the land, and made that great gulph which we call the Mediterranean. Now this is not only fabulous, but a hiſtory of thoſe remote times, which has been diſguiſed, either from the ignorance of the people, or through the love they had for the marvellous, the two moſt ancient frailties of mankind. That Hercules ſhould ſeperate two mountains, with his two hands, is abſolutely incredible; but that in the time of one Hercules, or other, for there were fifty of that name, the ocean ſhould force down two mountains, not ſo ſtrong as others in the world, perhaps through the aſſiſtance of ſome earthquake, and ſo take his courſe betwixt Europe and Afric, gives me no manner of pain to believe. What a notable ſpot might the lunar-inhabitants all of a ſudden diſcover on our earth; for you know, Madam, that ſeas are ſpots. It is no leſs than the common opinion, that

Sicily was ſeparated from Italy, and Cyprus from Syria: There are ſometimes new iſlands formed in the ſeas: earthquakes have ſwallowed up mountains, others have roſe and altered the courſe of the planets. The philoſophers give us apprehenſions, that the kingdoms of Naples and Sicily, which are countries founded upon great ſubterranean vaults full of ſulphur, will one day ſink in, when thoſe vaults ſhall no longer be able to reſiſt the flames which they contain, and at this time exhale at thoſe vent-holes, the mouths of Veſuvius and Etna. Is not here enough to diverſify the ſight which we give to the people in the moon?

I had much rather, ſaid the Marchioneſs, that we had diſguſted them with the ſame object always, than divert them with the ſwallowing up of provinces.

I do not know, replied I, if within this little time there have not been ſeveral burnt up in Jupiter. What, provinces burnt up in Jupiter! cried ſhe; upon my word, that would be conſiderable news. Very conſiderable, ſaid I, Madam: we have remarked theſe twenty years in Jupiter a long trail of light, more glaring than the reſt of that planet's body. We have here had deluges, perhaps they may have ſuffered great conflagrations in Jupiter: how do we know to

the contrary? Jupiter is ninety times bigger than the earth, and turns on his own center in ten hours, whereas we do not turn in leſs than twenty four, which implies that his motion is 216 times ſtronger than ours. May it not be poſſible, that in ſo rapid a circulation, its moſt dry and combuſtible parts ſhould take fire, as we ſee the axle-trees in wheels, from the rapidity of their motion, will break out into flames? But however it is, this light of Jupiter is by no means comparable to another, which in all probability is as ancient as the world, and yet we have never ſeen it. How does a light order it to be concealed? ſaid ſhe; there muſt be ſome ſingular addreſs to compaſs that point.

This light, replied I, never appears but at twilight, which is often ſtrong enough to drown it; and even when twilight ſuffers it to appear, either the vapours of the horizon rob us of it, or it is ſo very faint, and hardly to be perceived, that for want of exactneſs in our knowledge, we miſtake it for the twilight. But, in ſhort, they have of late years with much certainty diſtinguiſhed it; and it has been for ſome time the delight of the aſtronomers, whoſe curioſity wanted to be rouſed by ſome novelty, and they could not well have been more touched, if

they had diſcovered ſome new ſecondary planets. The two latter moons of Saturn, for inſtance, did not raviſh them to that degree which the guards or moons of Jupiter did: but now we are fully accuſtomed to it; we ſee one month before and after the vernal equinox, when the ſun is ſet and the twilight over, a certain whitiſh light reſembling the tail of a comet. We ſee the ſame before ſun riſe, and before the twilight, towards the autumnal equinox; and towards the winter ſolſtice we ſee it night and morning, except at theſe times it cannot, as I but now obſerved, diſengage itſelf from the twilights, which are too ſtrong and laſting; for we ſuppoſe it to be a continued light, and in all probability it is ſo. We have begun to conjecture that it is produced from ſome prodigious quantity of matter crowded together, which circles round the ſun to a certain extent: the greateſt part of his rays pierce through this groſs circuit, and come down to us in a right line; but ſome reſting on the inner ſurface of this matter are from thence reflected to us, and come with the direct rays, or elſe we cannot have them either morning or evening. Now as theſe reflected rays are ſhot from a greater height than thoſe which are direct, we muſt conſequently have them ſooner, and keep them longer.

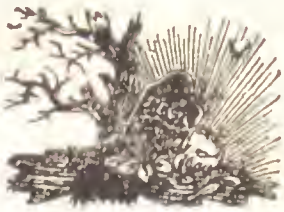
On this foot, I muſt acquieſce in what I have already mentioned, that the moon muſt have no twilight for want of being ſurrounded by ſuch a groſs air as the earth. But ſhe can be no loſer; her twilights will proceed from that kind of groſs air which ſurrounds the ſun, and reflects his rays on places which his direct ones cannot reach. But pray let me know, ſaid the Marchioneſs, are not there twilights ſettled for all the planets, who will not need every one to be clothed with a diſtinct groſs air, becauſe that which ſurrounds the ſun alone may have one general effect for all the planets in the vortex? I am mighty willing to think dame nature, agreeable to that inclination which I know ſhe has to œconomy and good management, ſhould make that ſingle means anſwer her purpoſe: yet, replied I, notwithſtanding this ſuppoſed œconomy, ſhe muſt have, with reſpect to our earth, two cauſes for twilight; one whereof, which is the thick air about the ſun, will be wholly uſeleſs, and can only be an object of curioſity for the ſtudents of the obſervatory; but not to conceal any thing, it is poſſible that only the earth ſends out from herſelf vapours and exhalations groſs enough to produce twilights, and that nature had reaſon to provide, by one general means, for the neceſſities of all the other planets, which are, if I may

ſo ſay, of a purer mould, and their evaporations conſequently more ſubtile. We are, perhaps, among all the inhabitants of the worlds in our vortex, the only perſons who required to have a more groſs and thick air given us to breathe in. With what contempt would the inhabitants of the other planets conſider us, if they knew this?

They would be out in their reaſoning, ſaid the Marchioneſs, we are not to be deſpiſed for being enveloped with a thick air, ſince the ſun himſelf is ſo ſurrounded. Pray tell me, is not this air produced by certain vapours, which you have formerly told me iſſued from the ſun, and does it not ſerve to break the firſt force of his rays which had elſe probably been to exceſs? I conceive that the ſun may be veiled by nature, to be more proportioned to our uſe. Well, Madam, replied I, this is ſome ſmall introduction to a ſyſtem which you have very happily ſtarted. We may add, that theſe vapours produce a kind of rain, which falling back upon the ſun, may cool and refreſh it, as we ſometimes throw water into a forge, when the fire is too fierce. There is not any thing but what we may imagine, to aſſiſt nature's addreſs; but ſhe has another kind of addreſs very particular, which is to conceal herſelf from us, and we ſhould not willingly be confident that we have found

out her method of acting, or her designs in it: in case of new discoveries, we should not be too importunate in our reasonings, though we are always fond enough to do it; and your true philosophers are like elephants, who as they go, never put their second foot to the ground, till their first be well fixed. The comparison seems the more rational to me, said she, as the merit of those two species of animals, elephants and philosophers, does not at all consist in exterior agreements. I am willing to mistake the judgement of both. Now teach me some of the latter discoveries, and I promise you not to make any rash systems.

I will tell you, Madam, replied I, all the news I know from the firmament, and I believe the freshest advices you can have. I am sorry they are not as surprising and wonderful, as some observations which I read the other day in an abridgement of the Chinese Annals, written in Latin. Those people see thousands of stars, at a time, fall from the sky into the sea, with a prodigious noise, or are dissolved, and melt into rains; and these are things which have been seen more than once in China. I met with this observation at two several times, pretty distant from each other, without reckoning a certain star, which goes eastward, and bursts like a squib,

always with a great noiſe. It is a great pity that theſe kinds of phænomena ſhould be reſerved for China only, and that our part of the globe ſhould never have their ſhare of theſe ſights. It is not ſo long, ſince all our philoſophers were of opinion, that they might affirm on good grounds, that the heavens and all the celeſtial bodies were incorruptible, and therefore incapable of change; and yet at the ſame time, there were ſome men in other parts of the earth who ſaw ſtars diſſolve by thouſands, which muſt produce a very different opinion. But, ſaid the Marchioneſs, did we ever hear it allowed that the Chineſe were ſuch great aſtronomers? It is true, we did not, ſaid I, but the Chineſe have an advantage from being divided from us by ſuch a prodigious tract of earth, as the Greeks had over the Romans, by being ſo much prior in time: diſtances of every ſort, pretend a right of impoſing on us. In reality, I think ſtill more and more, that there is a certain genius which has never yet been out of the limits of Europe, or at leaſt not much beyond them; perhaps he may not be permitted to ſpread over any great extent of the earth at once, and that ſome fatality preſcribes him very narrow bounds. Let us indulge him whilſt we have him; the beſt of it is, he is not linked to the ſciences and dry ſpeculations, but

launches out with as much ſucceſs into ſubjects of pleaſure. In which point I queſtion whether any people equal us. Theſe are ſuch topics, Madam, as ought to give you entertainment, and complete your whole ſyſtem of philoſophy.